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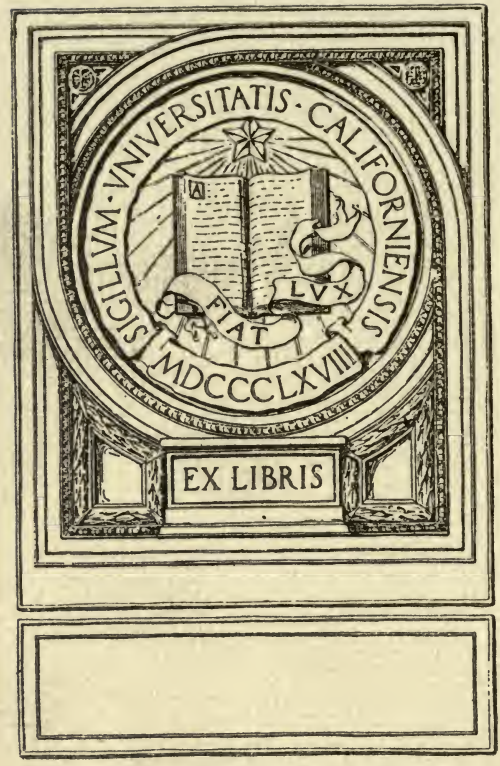
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Treatise on Comprehensive Accounting Methods Adapted to Shoe Manufacturing and Other Industries

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Part I

Accounting and Costs

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Chapter 1

OPENING

IT has always appeared to the author that very few shoe manufacturers have studied the history of shoe manufacturing or have looked very far into its future. Those who have will agree with me that compared with other manufacturing industries some of the methods usually practised in producing shoes are crude and unscientific.

Great changes are taking place constantly,— changes which, through the efforts of trained, scientific men and the use of superior machinery, result in reducing the cost of constructing shoes. In the years to come, the largest concerns of to-day, active in producing, jobbing and retailing shoes, will be looked back upon as infant industries.

Since the publication of "Organizing a Shoe Factory," great strides have been taken by many manufacturers. They have introduced scientific methods of handling materials and more humane ideas regarding employees. They have realized that in order to secure the quality and quantity of work which they desire, it has become necessary to use some system other than that of labor driving. They realize also that in the past there has been tremendous waste of material, and they are making efforts to prevent such waste. They know that the cost of distribution or selling is far too great, but as yet it has been impossible to reduce it as low as it should be.

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10 COMPREHENSIVE ACCOUNTING METHODS

During the past ten years much has been said and written about the so-called "Scientific Management" which would lead one to believe that the exponents of this supposedly newly discovered science had found a panacea for all the ills and grievances to which manufacturing industries were subjected. Many of the devotees of this new science have criticized and condemned the work of so-called "Systematizers" and "Cost Accountants." From the standpoint of the writer there is no question but that the work of some systematizers and cost accountants is open to severe criticism. However, let us look at the subject of cost accounting applied to a shoe manufacturing industry in its true light. Shoe manufacturing as ordinarily conducted is a contracting business, and the inability to recognize this condition has been the cause of the failure of a great many shoe factory cost systems.

Harrington Emerson has defined efficiency as the relationship between *what is* and *what ought to be*. This definition is very good and is directly in line with what the writer believes cost accounting should show.

In no instance that has come to the attention of the writer has a cost system, except the one herein described, done anything more than to furnish a mass of statistics showing what *has been* accomplished. It has been the practice of most cost accountants to devise cost systems showing what has been done during a past period as compared with some previous period or periods, merely showing improvements or retrogressions. Such cost systems are all very well as a matter of statistics and the figures are sometimes very interesting; but what do they show as compared with what they ought to show? In other words, if from such a mass of statistics we derive the fact that a manufacturing concern has made a profit for a period, say of $10,000, is there any-

thing to show that it should or should not have made a profit of $20,000 during the same period? It is this lack in cost systems of showing what concerns have done as compared with what they should have done that has disgusted so many efficiency engineers and made them conclude that cost systems were of comparatively little value. This conclusion has undoubtedly been reached because of a misconception of what a real cost system actually is. As a matter of fact, the basis of the so-called scientific management and the basis of a true cost system are identical, the difference being that a true cost system not only includes the features covered by scientific management but goes much farther. The so-called scientific management first sets standards and then endeavors to live up to those standards. So should the cost system as applied to the shoe manufacturing industry.

In many industries scientific management has accomplished some apparently great feats, but in most part these feats have consisted in inducing labor to perform greatly increased tasks for comparatively small increases in earnings. If we should apply the same tactics to the shoe business, we might make a considerable saving in labor cost, but the labor cost of a pair of shoes is not the item of prime importance. A 10% saving in material is about equal to a 25% saving in labor when the cost of all shoes is averaged.

In order to know what degree of efficiency is being attained in an entire business, it is first necessary to set standards and to keep records showing how near to these standards the business as a whole is operated.

The writer realized many years ago that cost accounting as ordinarily applied to the shoe manufacturing business fell far short of accomplishing the purpose for which it was designed, and he has for many years treated the proposition

of cost accounting in exactly the same manner that the devotees of the newly discovered scientific management treat their subjects.

Realizing the fact that the majority of shoe factory cost accounting systems were entirely inadequate and unsatisfactory, it has for years been the author's ambition to write a book on this subject, outlining his views and explaining in detail his methods. Lack of time has prevented the carrying out of this desire, and he now takes great pleasure in placing before the public this book, which illustrates the possibilities of a complete cost system and which also will serve as a basis of a universal accounting system for all shoe factories. In other words, the principles of the methods herein shown are of universal application, only a few of the details being found to differ in any particular case.

In 1910, the writer published a little book called "Organizing a Shoe Factory," with the idea of stimulating an interest in manufacturers to be more efficient themselves and to get greater efficiency in their business. In a few cases the purpose of this little book was not understood and some readers were disappointed not to find working plans,— both for the mechanical and accounting divisions of their business.

Without criticizing too severely the majority of the methods at present employed, the present book is intended to show that not only the great majority of manufacturers spend their money for very poor accounting, but that they can, if they so desire, have an accounting system which is efficient and which will at all times show them not only the condition in which their business is, but also the degree of efficiency which is maintained.

Chapter 2

UNIVERSAL ACCOUNTING

EVERY manufacturing concern should have an efficient accounting system. Many have found their systems inefficient and have become dissatisfied, but the managers of these concerns, not being accountants, have been unable to make the accounting systems what they desired. Many so-called accounting systems are mere bookkeeping systems introduced by some business college graduate, or perhaps, by some bookkeeper of considerable experience. They are usually inefficient, and if the other portions of the business were operated as inefficiently, the concern would be put out of business. Habit, as much as anything, has been responsible for this inefficient accounting.

In planning accounting systems, the lack of standardization of accounts is continually felt by statisticians in any industry that has been investigated. Public service corporations and banks have, to some extent, been forced by commissions and accountants to adopt uniform methods of bookkeeping. It would be an excellent thing if every industry could be persuaded to adopt standardized methods of accounting. It would not only be valuable for individual plants, but would greatly enhance the value of all public statistics, which to-day are in many cases useless because of lack of uniformity.

Shoe manufacturing is no exception to the rule. There

has never been any standard of classification of accounts by which comparisons could be readily and accurately made. Manufacturers frequently get together, compare notes, and differing widely on many items, wonder at the cause. Had they a clear conception of the three fundamental items that make up the cost of their product and had the detail of those items been subdivided in their books of account in an identical manner, they could compare notes far more intelligently.

To illustrate this point, the writer will cite an experience in Lynn.

Two manufacturers were discussing the question of costs. One was a director in a Lynn bank. The other was seeking a loan from that bank. The bank director finally asked what the other man used as an estimate for findings cost, and when told 10 cents per pair, exclaimed, "You can't borrow any money at my bank if that is all you know about figuring shoes."

The man seeking the loan was not satisfied and demanded to know how much he should estimate, and was told 20 cents per pair.

Each thought there was something radically wrong with the figures of the other and each was justified in so thinking, for to neither was the cost of findings 10 cents per pair. The man using the ten-cent estimate was more nearly correct, for a detailed list of costs used by the bank director manufacturer included lasts, machinery and other items which did not belong in findings cost.

Almost every shoe manufacturer has compared notes with others and has observed the varying results produced by different accounting systems. This book is consequently offered as illustrating a basis of a universal accounting system for shoe manufacturers, as stated in the previous chapter.

The system described in this work is efficient, it is not complicated and can be operated by any bookkeeper of ordinary ability. It is based upon the principle of double entry bookkeeping, which is — for every debit there must be a corresponding credit. A debit is always either an asset or an expenditure. A credit must be either a liability or an income, the result of the investments made in assets and expenditures.

The system herein described and illustrated does not separate the regular bookkeeping from the cost work, but inaugurates the cost work as a part of the general accounting. The reason for so doing is that the profit and loss figures shown in reports of costs and the balance sheet of the same date must correspond, whereas, in other systems not so combined, the accuracy of the cost accounting reports cannot be proved, there being no balance sheets made at corresponding dates.

The system is perpetual, inventories being constantly taken. The necessity of closing down factories at fixed dates once or twice a year with the extra burden of cost from loss of production and the clerical expense of figuring the completed inventory is thus avoided.

A well-organized factory with such a system as is described may at all times be compared to the ocean liner in perfect order. Without such a system, the factory is like the ocean liner in a thick fog with the compass lost.

It may cost a trifle more to operate this system, but this additional expense is saved in other places, and its true worth cannot be estimated. The satisfaction of always knowing the exact results of the business is of inestimable value.

In the cost system as outlined, two types of estimates are shown; one, very simple but efficient, designed to keep a close knowledge of a business by means of a percentage sys-

tem based upon averages; the other, a more complete and accurate system, in which the condition of the business in detail is shown at stated periods. The units of time used are one-half day, one day, one week, periods of either four or five weeks, and a period of six months or twenty-six weeks.

In the classification of accounts given in the following chapters, purchases of all kinds are included but no detail of arrangement is shown. Controlling accounts should be kept in a private ledger with auxiliary ledgers provided to show details. It is also advisable to keep a distribution ledger to show details of labor and expense (intangible things), all tangible things being accounted for in detail by the store department. The list of accounts shown can, with some slight changes in details, be made standard for all factories. The three prime items of cost are Merchandise, Labor and Expense.

In Merchandise are included all materials that go into shoes, are necessary for their construction or go away with them. For example, upper and sole leather, linings, lasting tacks, cartons and cases.

The merchandise account may be separated into five general divisions: upper department materials, sole department materials, supplies, regular findings and excess findings.

In upper department materials will be included all leather, cloth, etc., that is used in preparing the uppers of shoes for the stitching room.

In the sole department materials will be found all leather and substitutes for leather which are used to make up the bottoms of shoes.

In supplies will be included certain items usually small in value but which can, nevertheless, be figured as specific costs which change in different shoes.

Regular findings will include all of that great class of

articles, the cost of which is small in some departments and quite large in others, but which are necessary to the construction of shoes or go away with them, the cost of which applies equally to all shoes.

The excess findings will include other items of merchandise of the same nature as regular findings but which are used on some shoes in addition to the regular findings.

Labor, the second prime item of cost, will be divided into two classes — Productive and Non-Productive.

Productive labor will include only those employees actually working on shoes, and it will be further divided into departments and into Day and Piece labor.

Non-Productive labor will include all employees (except salesmen) who are not actually employed in producing shoes, and will be further divided into Manufacturing and Distributive labor.

Manufacturing labor will be divided into Executive, Superintendence, Office and General.

Distributive labor will be divided into Executive and Office.

Expense will be separated into two main divisions. The first division will include expenses not absolutely necessary to either the manufacturing or selling of shoes and will be termed Administrative Expense.

The second division will include expenses which are necessary to either the producing or selling of shoes and will be further subdivided into Operative and Distributive Expense.

Operative expense will include royalty and depreciation on machinery and equipment.

Distributive expense will include all costs of selling and of collecting accounts.

An organization which operates more than one factory

and has branches should have three or more main divisions of expenses, but the writer is considering in this instance a business having one factory only. To make the subject as clear as possible, all complications that can be, have been avoided, and accordingly no details regarding sole cutting, heel building or the carrying of stock shoes are considered, no provision being made for the cost of operating such items.

If a stock shoe department is run in connection with a manufacturing business, it should be treated as a separate business, being charged with rent for the space it occupies to carry on its affairs and also with the capital used in its operation, as well as insurance, taxes, interest, etc. It should not be charged with shoes at cost plus a profit, but the factory should be credited and the stock shoe department charged with goods at *total manufacturing cost*, as shown in Chapter 5, on Form No. 1.

The illustrations of costs and estimates as shown in the following chapters are purely imaginary, and are not copied from any particular business, but they will be found upon test to be true comparisons. A vast amount of careful work has been expended in making them.

Chapter 3

CLASSIFICATION OF ACCOUNTS

THE main books required are a private ledger and one or more sales ledgers. A purchase ledger may or may not be used, according to the wishes of the individual accountant or manufacturer, but a distribution system where all purchases and expenses are finely divided is indispensable. No forms will be shown for the above, or for sales books and invoice registers, as there are many kinds which are equally good. Forms will be shown for stores and cost keeping.

At this stage we are only interested to get at the foundation. Many manufacturers have no systematic method of checking an invoice. One person will "O.K." it at the left-hand top corner, another at the bottom, etc. The best method is to have a rubber stamp similar to the one shown in Chapter 6. The auditor must not pass the invoice for payment unless all spaces on the invoice have been properly filled in. The auditor's approval should show on the check and not on the invoice.

This classification and arrangement of accounts is in keeping with the explanations and argument in Chapter 2.

By reference to the Estimate Sheet, Form No. 1, Chapter 5, the reader will observe that the accounts classified herewith are in accordance with the line-up of this estimate sheet.

The object is to be able to prove any division of these

estimate sheets in total at the end of a season, and to have all cost accounting based upon this sheet, for it is the foundation of the whole cost system, as it should be in any shoe manufacturing business, being the basis upon which all contracts are made.

MERCHANDISE DIVISION

Upper Department	Regular Findings
All Upper Leather	Blackings
Cambric	Bobbins (Wound)
Canvas	Cements
Cloth for Tops	Chalks
Drills	Cheesecloth
Duck (Except Gem)	Chemicals
Flannels	Cleaners (Except "Excess")
Gore	Crayons (Marking)
Stays	Dressings
Sheep Skins	Filling (Bottom)
Tongues	Flour
Top Facings	Inks (Except for Office)
Etc.	Nails (Shoe)
	Oil (Not Machinery)
	Paper (Except Tissue and Covers)
Sole Department	Paste
	Polishes
Box Toes	Sandpaper
Counters	Scouring Paper
Cushion Felt	Shellac
Flexible Leather	Silk
Gem Duck	Silkolene
Heels	Sponges
Inner Soles	Stains
Outer Soles	Stickers
Rubber Heels	Tacks
Sole Leather	Thread
Taps	Twine
Top Lifts	Wax
Etc.	Wire (Except Button Wire)

SUPPLIES

Buttons
Cartons
Cases
Eyelets
Heel Pads
Hooks
Labels (Inside)
Laces
Nails (Shipping)
Pull Straps
Ribbons
Seam Welting
Shanks
Sock Linings
Stays
Tissue Paper
Etc.

EXCESS FINDINGS

All material used on button shoes in stitching room, such as:
Thread
Silk
Twist
Wire

Patent Leather Repairer
Tan Leather Repairer
Waterproofing
Etc.

LABOR DIVISIONS

NON-PRODUCTIVE

EXECUTIVE

General Manager
Assistant General Manager
Sales Manager
Treasurer and Credit Manager
Auditor
Production, Cost and Office Manager
Purchasing Agent
Paymaster
Advertising Manager

OFFICE

All Office Help

SUPERINTENDENCE

Superintendent
Quality Manager
Department Foremen
Shipper
Storekeeper

SUNDRY

Mechanics
Engineer
Firemen
Elevator
Etc.

PRODUCTIVE

	Day	Piece
Cutting Department,		
Stitching "	"	"
Stock Fitting "	"	"
Lasting "	"	"
Bottoming "	"	"
Finishing "	"	"
Packing and Shipping Department "		"

EXPENSES — ADMINISTRATIVE

Club and Association Dues
Traveling in connection with above
Charities
Audit and Legal aside from Collection Expense
Sundries

EXPENSES — OPERATIVE

Rent
Taxes
Insurance
Interest
Power and Heat
Freight, Express, etc.
Shoe Loss Allowance
Water, Light and Telephone
Machinery Repairs
Factory Equipment Repairs
Extra Cost of Samples
Office Supplies
Sundries

EXPENSES — DISTRIBUTIVE

Advertising
Bad Debts
Discount
Mercantile Agencies, etc.
Salesmen's Salaries or Commissions
Traveling Expenses

MACHINERY, EQUIPMENT, PARTS, TOOLS, ETC., WHICH STORE DEPARTMENT WILL DISTRIBUTE

Machinery

All Machines, Freight and Drayage, and the labor cost of setting them up
Belting
Hangers
Pulleys
Shafting
Lasting Jacks
Etc.

Factory Equipment

Benches
Bins
Electrical Supplies
Furniture
Hangers for Shoes
Partitions
Racks
Scales
Etc.
Labor on all new construction

MACHINE PARTS AND REPAIRS

All Machine Parts
Awls
Belts (Practically all)
Belt Hooks
Belt Fasteners
Belt Lacings
Belts when used for new construction should be charged to Machinery Account
Replacements to Operating Cost
Edge Cutters and Irons
Emery Wheels (Replacements)
Feed Points
Felt Roll (Replacements)
Groovers
Heel Trimming Cutters
Heel Breasting Knives
Naumkeag Pads (Replacements)
Power Brushes (Replacements)
Roll Covers (Replacements)

LASTS AND SOLE PATTERNS, ETC.

Forms
Lasts
Sole Dies
Sole Patterns
Tree Feet

UPPER PATTERNS AND DIES

Clicking Dies
Hand Dies
Upper Patterns

TOOLS AND APPLIANCES

NOTE: Tools should be divided into "Shoe Tools" (that is, tools which are used actually on shoes) and "Sundry Tools," (that is, tools which are used around the plant but are not used on shoes).

Awls
Brooms
Carpenters' Tools
Hammers
Hand Brushes
Hatchets
Knives (Not Machine)
Machinists' Tools
Mauls
Oil Cans
Polishing Cloth
Saws
Etc.

POWER AND HEAT

Fuel
Cartage and Freight on Fuel
Cotton Waste
Engine Oil
Machine Oil
Etc.

PRINTING AND STATIONERY

Books
Covers
Paper
Printing
Tags
Etc.

SANITARY SUPPLIES

Toilet Paper
All Cleaning Materials
Etc.

Chapter 4

EXPLANATION OF ESTIMATES

IN arranging the following estimates and accounts it seemed inadvisable to complicate the accounting by having the shoe company own the land and building, therefore, they will be considered as owned by a separate company. The manufacturing concern is to pay rent for use of the building equipped ready to make power and heat, with a sprinkler system, and with such other contrivances as would be furnished with a well-equipped building ready to install shafting and machinery. All pulleys, belts, hangers, shafting and machinery will belong to the operating company, with the exception of those which pertain to the main power drive.

There are several reasons for doing this, the chief one being that it is the easiest way to show the capital invested in the manufacture of shoes, which capital should earn a far greater per cent than capital invested in the land and building. The owners of the capital invested in the real estate may well be content with a small profit over and above the fixed charges for upkeep, taxes, insurance, etc. On the capital invested in the shoe manufacturing industry, we hope to realize earnings of not less than 20% net. The real estate and building investment ought not to and cannot earn any such a rate. Therefore, we start on a basis of paying rent. By making figures on this basis, it will be much

easier for any accountant or manufacturer, who is interested, to study the figures and apply any or all parts of them to some specific business than it otherwise would be.

Instances have come to the writer's notice where an organization owning a number of factories put such a heavy burden upon the superintendents in charge that they were unable to make shoes good enough to meet the requirements of the trade at the prices allowed them. In one instance a concern erected a new factory and insisted that it should be all paid for in two years by adding it to the figured cost of the shoes. They should have foreseen the results which were: short sales, poor quality, much loss by inferior and returned shoes and a further loss of customers who were dissatisfied, all owing to the mistaken policy of trying to depreciate the building in a couple of years. They should have been satisfied to have done it in ten years.

After the plant has been paid for, some manufacturers go to the other extreme and reduce the burden to be figured upon the product, because there is no investment in real estate and buildings, and in many cases machinery. Shoes are then figured too low and the jobber or retailer is given an advantage which he is not entitled to.

The sensible and winning policy is to charge the product with what it ought to bear under an efficient management. If investments are depreciated too fast, shoes will be figured too high. If depreciated too slowly, shoes will be figured too low.

The figures used in the next chapter are based upon a brick building which should be good for twenty years and has been depreciated on that basis. The fund created by the depreciation may be invested in any way which suits the building management, a good way being to loan it to the operating company at 4 or 5%. They do not want to pay

it out in dividends because later on they may desire to build another factory.

In making shoes of various constructions and kinds, and selling them to both jobbers and retailers, and possibly also to their own stores, complications will arise which necessitate that more detail be added.

It is the intention in this case to show the results of a fairly large business operating a single factory, in order to leave out the complications which would confuse. The business in question is treated as though it had been running for some time before the following method was introduced.

The output of this factory should be 400,000 pairs of shoes every six months, at an average price of $2.50 per pair, a money value of $1,000,000.

It is possible to make 425,000 pairs, but it is wiser not to estimate the maximum capacity. Therefore, estimates will be made on the smaller figure.

The figures used as an illustration herewith are not copied from any concern, but are similar to those found in a great number of factories. The product is to be distributed entirely to the retail trade in the usual way by salesmen and advertising. It will require a capital and loaning capacity of from $600,000 to $850,000, depending entirely upon the number of repeating orders which will determine the number of times the capital is turned over. We will, therefore, start on the basis that the capital stock of the company is $600,000. We are going to strive for 6% net profit upon the sales, which will be equivalent to $60,000 for six months operation, or 20% per year upon the capital.

Having arranged these estimates as above, we are ready to proceed with a plan for an accounting system. It is not necessary to go into all the details or show every printed form needed to carry on the business, but enough will be

shown to give ample illustrations and bring out all vital points.

It must be borne in mind that a *shoe manufacturer* is a *contractor*. He constructs a line of samples, sends salesmen out on the road to sell his product months in advance of delivery dates, and his samples and order books specify the terms of his contracts under which he agrees to deliver certain goods at certain prices. His estimate figures must all be made, if he is to know what he is doing, long before the salesmen leave, and the accounting must demonstrate the accuracy of those estimates.

The arrangement of accounting here shown is designed to furnish this proof in three ways. Therefore, it can be adopted by the man who likes to see much detail in order to satisfy himself, it can be adopted by the man who cares only to know that he is headed in the right direction, and that all his estimates are being verified, or it can be adopted by the man who desires a reasonable proof that every branch is operating within a certain per cent of his estimates.

The first method is illustrated in Chapter 7, by "Detailed Reports." In these reports the reader will find that every cost of the business is reduced to a positive proof. The minutest costs are considered and the condensed reports are compiled therefrom.

At each balancing period, all items of cost of operation are charged to "Goods in Process," and the shoes finished are charged to "Finished Shoes." The difference between estimates and cost are debited or credited to Operating Gain and Loss or Distributive Gain or Loss.

The second method needs no illustration, because it is the same as the first, except that nothing is completed in the form of reports. The result is actually as if a bookkeeper kept an accounts receivable ledger without taking a

trial balance. The cutting test slips would show gains and losses day by day, but no complete tabulations would be kept to show the period results. Other estimates would be kept in like manner. Some clerical cost would be saved over the first method, but the manufacturer so operating never knows of a great loss until it may be too late.

The third method goes beyond the second, but not as far as the first, and can be operated under any conditions provided the plan is properly arranged. A table of percentages can be constructed to guide each department. More on this subject will be found in Chapter 8.

There are two methods of estimating shoe costs. They can both be developed from Exhibit No. 1. On Form No. 1 is an illustration of a method of listing all material, labor costs and fixed charges after standards have been properly arranged.

The other method (See Exhibit No. 2) is a sort of "Process of Elimination," and is the better method for making quick estimates, and is a means by which salesmen can be taught how to estimate shoe costs at a minute's notice, but does not give enough detail regarding cost of material or labor.

More than $\$1.31\frac{1}{4}$ cannot be allowed for the merchandise part of the shoe. Here is the opportunity always open to the manufacturer to display his ability or cunning, as policy and his make-up direct; and they would be reflected perfectly if many sets of figures could be compiled as Exhibit No. 8, Chapter 8. One manufacturer making a $2.50 shoe may put in only 47% material and 25% labor, whereas another will put in 54% material and only 18% labor. The labor market is partly responsible for this condition, but lack of science is a large cause.

As stated previously, estimates are to be based upon a

business of 400,000 pairs, selling at an average price of $2.50 per pair. The figures below are to illustrate the first gross estimate to be made and also the prime figures for the third method mentioned. (See Chapter 8 for complete figures.)

EXHIBIT No. 1

GROSS COST ESTIMATES FOR SEASON

ITEMS	AVERAGE COST PER 100 PAIR	PER CENT COST	MONEY VALUE
All Material Less Discount	$131.25	52.50	$525,000.00
" Labor { Non-Productive	5.68	22.00	220,000.00
" Labor { Productive	49.32		
" Royalties	5.75	2.30	23,000.00
" Depreciation	5.00	2.00	20,000.00
" Operative Expenses	10.00	4.00	40,000.00
Ready to Sell	$207.00	82.80	$828,000.00
All Distributive Expenses	$22.50	9.00	$90,000.00
" Selling Discount	5.00	2.00	20,000.00
Distributive Cost	$27.50	11.00	$110,000.00
All Costs	$234.50	93.80	$938,000.00
Sales Value	250.00	100.00	1,000,000.00
Gross Profit	$15.50	6.20	$62,000.00
Administrative Expenses	.50	.20	2,000.00
Net Profit	$15.00	6.00	$60,000.00

Exhibit No. 2 is an illustration showing that only $1.31¼ can be put into the material. See Estimate Sheet, Form No. 1, for a demonstration of the details of this, but note that the amount is $1.3375 and the estimated net profit is 5% instead of 6%.

It is proposed by efficient methods to effect savings which will bring the profits up to 6%, which will produce 20% profit on capital invested.

In order to simplify figuring and have close allowances, all shoes should be estimated in one hundred pair lots. By so doing, fractions of a cent may be dropped without any variation worth consideration and odd numbers of pairs can be priced very quickly.

EXHIBIT No. 2

"PROCESS OF ELIMINATION"

1st.	The Selling Price of a shoe is			$2.50
2nd.	Profit	@ 6.00% =	.150	
3rd.	Administrative Expense	" .20% =	.005	
4th.	Selling "	" 11.00% =	.275	
5th.	Operative "	" 4.00% =	.100	
6th.	Depreciation	" 2.00% =	.050	
7th.	Royalty	" 2.30% =	.0575	
8th.	Non-Productive Labor	" 2.27% =	.0568	
	Total Fixed Charges			.6943
	Balance left for Productive Labor and Materials			$1.8057
9th.	All Productive Labor Costs			.4932
10th.	Balance left to use in detailed materials			$1.3125

In Operative Expense will be found every expense item that is incurred in the process of making shoes.

In Distributive Expense is kept every item of expense necessary in selling goods and collecting the accounts.

Any expense not included in the two classes above will, therefore, be for something other than the making or selling of shoes.

Administrative Expense will include Legal and Audit, Association Dues, some Traveling, Charities, etc.

In a large concern with more than one factory, having jobbing houses, etc., it is necessary to keep a large amount of expenditure under the above heading, but not in the

business herein described, therefore no detailed estimates are shown. However, by referring to Exhibits Nos. 1 and 8, the reader will see that an allowance of $2,000 was made for the total of this expense; by referring to Form No. 1, that 50 cents per one hundred pairs was allowed in the Estimate Sheet.

Dividends will not be considered as an expense, but must come out of profits.

It is generally agreed by the best accountants that expense burden should be applied to any given shoe *pro rata* to the Productive Labor cost. The theory is that under normal labor conditions, the shoe which is the slowest and hardest to make will incur the highest labor cost, but in many places where labor unions are strong, this condition is not found but quite often the reverse.

There are several other methods in use, but in this case we will assume that the product is so nearly uniform that a fixed price can be used. Estimates of operation expense will therefore be made at an average price of 10 cents per pair. Such expenses as Taxes, Insurance and Interest should be pro-rated each period and no actual loss or gain can be shown on Taxes until tax bills are received.

Special schedules of Productive Labor should be arranged from which the labor cost of shoes may be estimated rapidly. There are many ways of doing this after a general price list for all work has been made.

The simplest method is to standardize all operations in each department that will apply to certain shoes, and by using a series of numbers, group them so that the cost clerk looks at a sample or style and jots down the correct group numbers that the shoe falls into. Then the figures are assembled by these combinations until the whole labor cost is entered on the estimate sheet.

At the conference on Scientific Management, held at Dartmouth College, October, 1911, one of the speakers said that a business scientifically managed would divide a year into thirteen periods of four weeks each. The writer fifteen years ago began to advocate this method, because it made possible accurate cost figure comparisons, whereas, a business conducted on a monthly basis cannot have accurate comparisons except at considerable expense when labor is paid weekly and other costs are considered monthly.

There are two serious disadvantages in the adoption of the four-week method. First, all previous monthly statistics become useless and much expense is incurred if any comparisons are to be kept. Second, much additional work is necessary in order to close the books at irregular intervals when all statements of debtors and creditors are sent and received monthly. To overcome these objections, the writer conceived the plan of dividing the year into twelve periods as follows:

Eight periods of four weeks each and four periods of five weeks each. By so doing, each period can be made to terminate so near the end of the month that the widest variation at any one time will be three days; therefore, all the objections to the four-week method are removed and the advantages of accurate comparisons secured. Notice the season layout in the next chapter and observe how easy it is to construct reports beginning with one-half of a day as a unit and building up one week and then four or five weeks for a Period.

In the next chapter actual allowances are shown.

This chapter will close with a copy of the opening trial balance, called "Exhibit No. 3," showing the titles of accounts which are to be kept in the private ledger. Some of the accounts at opening, do not have any balances. The trial

balance represents the starting of a new run of business as at inventory period.

In arranging the accounts, it will be noted that they follow the English method of accounting, which always considers liabilities first. There are four main divisions to be considered as follows:

100 Liability Accounts.
200 Asset Accounts.
300 Expense Accounts.
400 Adjustment Accounts.

The cipher affix is used to key up the accounts.

EXHIBIT No. 3

SMALL, NICHOLS & CO., INC., SHOE MANUFACTURERS

Trial Balance at Start, September 30, 1912

NO.	ACCOUNT NAMES	DEBITS	CREDITS
101	Capital Stock		$600,000.00
102	Surplus		63,309.85
103	Reserve for Machinery, Equipment, Lasts, Patterns and Dies Depreciation		77,200.00
104	Reserve for Shrinkage of Accounts Receivable		2,778.61
105	Notes Payable		100,000.00
106	Accounts Payable		18,762.30
107	Discount Anticipated on Accounts Receivable		11,322.12
108	Discount Deducted from Raw Merchandise		4,679.67
201	Cash in Banks	$47,432.90	
202	Cash in Office	500.00	
203	Accounts Receivable Ledgers	566,105.75	
204	Personal Accounts	11,384.90	
205	Notes Receivable	2,000.00	
206	Stores Department Upper Ledger	56,780.30	
207	" " Bottom "	34,440.90	
208	" " Sundries "	25,770.50	
209	Goods in Process (All shipped)		
210	Finished Shoes " "		
211	Returned and Damaged Shoes	3,664.05	
212	Machinery	74,000.00	
213	Equipment and Fixtures	20,000.00	
214	Lasts, Sole Patterns and Dies	20,000.00	
215	Upper Patterns and Dies	10,000.00	
216	Labor Productive Prepaid	1,262.80	
217	" Non-Productive Prepaid		
218	Insurance Prepaid	222.25	
219	Interest "	2,762.60	
220	Taxes "	622.80	
221	Discount Anticipated on Accounts Payable	1,102.80	
301	Operative Expenses		
302	Administrative Expenses		
303	Distributive Expenses		
401	Operative Gain and Loss		
402	Distributive Gain and Loss		
403	Figured Profit		
404	Final Gain and Loss		
		$878,052.55	$878,052.55

Chapter 5

DETAILED ESTIMATES

Total Pairs	Average Price	Money Value
400,000	$2.50	$1,000,000

IF we operate for a season of twenty-six weeks, or one hundred and eighty-two days with three holidays and twenty-six Sundays out, we will have one hundred and fifty-three working days left. Twenty-six of these, however, will be Saturdays, or half days. Therefore, we will have in the six months, one hundred and twenty-seven full days and twenty-six half days. Reducing it all to a half-day basis, on which our sheets will be entered, we find two hundred and eighty half days.

To produce 400,000 pairs of shoes, it will be necessary to put in an average of 1,428½ pairs of shoes every half day. Operating schedule will be as follows:

OPERATIONS BEGIN	END	TIME	PERIOD NO.
Monday, Sept. 30, '12	Saturday, Nov. 2	5 Weeks	1
" Nov. 3 "	" " 30	4 "	2
" Dec. 1 "	" Dec. 28	4 "	3
" " 30 "	" Feb. 1	5 "	4
" Feb. 3, '13	" Mar. 1	4 "	5
" Mar. 3 "	" " 29	4 "	6
Total		26 "	

The closing date would, therefore, be March 29, 1913, profit basis to be 5% net on sales, or 12½ cents per pair, making a total of $50,000 for the six months' operations. The other 1% is to be saved on allowances.

The next step will be to make estimates for operating the factory and selling the product. As stated in Chapter 4, the factory will be rented, but below is given the basis on which the rent charge is to be arrived at.

The investment in land is $10,000; in building, power and heating plant, sprinkler system, etc., $60,000. Rent to be $9,000 based as follows:

Five per cent dividend on the investment of $70,000, $3,500; taxes and insurance, $1,500; reserve for depreciation of plant, 5% of the total investment, $3,500 a year; repairs, alterations, etc., $500.

EXHIBIT No. 4

MANUFACTURING OR OPERATIVE EXPENSE ESTIMATES

Based on 4% of Sales = $40,000

Divided as follows:

	26 WEEKS	4 WEEKS	5 WEEKS
Rent	$4,500.00	$692.31	$865.39
Taxes	2,000.00	307.69	384.61
Insurance	1,500.00	230.77	288.46
Interest	4,000.00	615.38	769.23
Power and Heat	2,000.00	307.69	384.61
Freight and Express	6,000.00	923.08	1,153.85
Water, Light and Telephone	1,000.00	153.84	192.31
Machinery Repairs	4,000.00	615.38	769.23
Factory Equipment Repairs	1,000.00	153.84	192.31
Extra Cost of Samples	2,000.00	307.69	384.61
Office Supplies	3,000.00	461.54	576.92
Sundries	2,000.00	307.69	384.61
Shoe Loss Allowance	7,000.00	1,076.92	1,346.15
Totals	$40,000.00	$6,153.82	$7,692.29
Output of Shoes in pairs must be	400,000	61,536	76,920

Allowance will be 10 cents per pair.

If we get above output at above costs, no gain or loss will occur. For figures of costs, see Report No. 8, Chapter 7.

EXHIBIT No. 5

NON-PRODUCTIVE LABOR ESTIMATE

	OPERATIVE			DISTRIBUTIVE		
	26 WEEKS	4 WEEKS	5 WEEKS	26 WEEKS	4 WEEKS	5 WEEKS
Executive	$7,540	$1,160	$1,450	$5,850	$900	$1,125
Superintendence	9,178	1,412	1,765			
Office	3,900	600	750	1,300	200	250
Sundries	2,106	324	405			
Totals	$22,724	$3,496	$4,370	$7,150	$1,100	$1,375

Operative Cost should therefore average $5.68 per 100 pairs.

Selling or Distributive Cost should average $1.79 per 100 pairs.

EXHIBIT No. 6

Distributive Expenses

Total Estimate 9% = $90,000 as follows:

	%	26 weeks	4 weeks	5 weeks
Selling Labor	.715	$7,150	$1,100.00	$1,375.00
Advertising	2.000	20,000	3,076.92	3,846.15
Mercantile Agencies, etc.	.100	1,000	153.84	192.31
Sundries	.185	1,850	284.61	355.77
Totals	3.000	$30,000	$4,615.37	$5,769.23
Bad Debt Loss	.500	$5,000		
Salesmen's Costs	5.500	55,000		
Totals		$90,000		
Discount	2.000	$20,000		

In applying these figures to shoes where they vary from $2.50, the average price, it will be necessary to use a fixed charge of 7½ cents per pair, plus 6% for salesmen's cost and bad debt losses, as salesmen are on a commission basis of 5½% and losses by bad debts are also based on a per cent.

The reader is again referred to Form No. 1 for specifications of a detailed shoe, which shows the application of these figures.

FORM No. 1

ESTIMATE SHEET

Sample No. 221 Date: Spring Season, 1912-13

Kind: Men's Box Calf Blucher Bal.

ITEMS	NO.	DESCRIPTION	COST	TOTAL
Whole Shoe	1		$60.00	
Vamp and Fox	2			
Quarter	3			
Collar	4			
Strap	5			
Tip	6			
Back Stay	7			
Leather Inside Stay	8		2.00	
" Quarter Lining	9			
" Strap "	10			
" Sock "	11			
Tongue	12		2.00	
Top Facing	13		1.15	
Drill Lining	14		2.50	
Vamp Doubler	15		.75	
Cloth Stays	16			
Toe Plug	17		.12	
	18			
Cripple Allowance	19		.25	
Total Upper Cost	20			$68.77
Outer Sole	21		25.00	
Inner Sole	22		10.00	
Tap	23			
Counter	24		5.00	
Box Toe	25		2.25	
Welting	26		4.50	
Heel	27		5.00	
Toplift	28		4.00	
	29			
Cripple Allowance	30		.10	
Total Bottom Cost	31			55.85
Buttons	32			
Cartons, Case and Tissue	33		3.50	
Eyelets and Hooks	34		2.00	
Heel Pads	35		.25	
Labels Inside	36		.50	
Lace or Ribbons	37		1.00	
Pull Strap	38		.60	
Shanks	39		.25	
Stays	40			
Total Supplies Cost	41			8.10

ITEMS	NO.	DESCRIPTION		COST	TOTAL
Regular Findings	42			$6.60	
Excess "	43				
Total Findings Cost	44				$6.60
Total Material Cost	45				139.32
Purchase Discount	46				5.57
Net Material Cost	47				133.75
		DAY	PIECE		
Cutting Labor	48	$ .25	$5.50	5.75	
Stitching "	49		9.46	9.46	
Stock Fitting "	50	1.03	.20	1.23	
Lasting "	51		5.00	5.00	
Bottoming "	52		21.51	21.51	
Finishing "	53		3.62	3.62	
Packing "	54	.45	2.30	2.75	
General "	55			5.68	
Total Labor Cost	56				55.00
Depreciation	57			5.00	
Shoe Loss Allowance	58			1.75	
Operative Expense	59			8.25	
Royalty	60			5.75	
Total Operating Expense Cost	61				20.75
Total Manufacturing Cost	62				209.50
Selling Expense	63			22.50	
" Discount	64			5.00	
Total Selling Expense Cost	65				27.50
Total Administrative Exp. Cost	66				.50
Total Cost	67				237.50
Selling Price	68				250.00
Profit	69	5%			12.50
Pairs Produced	70				

Chapter 6

RECEIVING AND STORE DEPARTMENT COST ACCOUNTING

THE best organized factory is one having but one Store Department; therefore, we follow this plan. The storekeeper will have charge under the purchasing agent who is general custodian of all raw material, etc.

The receiver's assistant shall fill out a slip, showing the number of packages, cases, bundles, etc., which are received, using a separate slip for each different lot.

Each invoice as received in the office shall have a rubber stamp impression placed thereon as shown herewith.

1. Lot No. .....
2. Date Invoice Received.....
3. Date Goods Received.....
4. Price and Discount O.K. .....
5. Extensions O.K. .....
6. Quantity O.K. .....
7. Quality O.K. .....
8. Entered Store Ledger.....
9. Charge Account of .....
10. Entered Period No. .....
11. Entered Invoice Book.....
12. Paid by No. .....

The Store Department shall fill in all of the items down to and including No. 10. The invoice is then ready to be sent to the financial accounting department.

All material of every nature which is issued from the Store Department shall be delivered on written requisition.

Three or more Store Department ledgers shall be kept by this department, sub-divided as follows: One for Upper Department, one for Bottom Department, and one for Supplies, Findings, Machine Parts, Office Supplies, etc.

The writer is here dealing solely with accounting methods, and while he believes that all stock should be sorted and graded in accordance with cutting standards, this feature will not be herewith treated. He is not going into the science of cutting leather, the handling of cutters under a bonus system, or any of the detail of scientific management. That would make a book of itself. Suffice it to say he has never heard of a cutting department, regardless of size, where it is not possible to increase profits by more efficient methods.

We will, therefore, proceed to take up the accounting for the Upper Department.

After a purchase of leather is received and the invoice has been checked up as described above, it shall be entered on "Leather and Cutter's Record," Form No. 2. This form has been designed so that it can be used as a stock ledger and a cutter's record. The purchases shall also be entered on the Stock Tag, Form No. 3, which is to be attached to the leather and kept with it until the lot is entirely cut.

The "Cutter's Slip," Form No. 4, is in itself a requisition and may be used as such.

As the stock is given to cutters, notations shall be made on the tag, Form No. 3. When the slip has been returned approved by the sorter and figured for costs, the results shall be entered upon Form No. 2, first, as a ledger record for the particular stock cut; second, on another sheet, as a record with the individual cutter.

This sheet, Form No. 2, is so arranged that a feetage

gain or loss is shown, and also a money gain or loss. The reason for this is as follows:

The estimate sheet may show an allowance of thirty-six feet of leather to cut a dozen pairs of shoes. The particular size run given the cutter, under the graded allowance system in use, may require thirty-eight feet. If the cutter uses the thirty-eight feet, there will be an actual money loss equivalent to two feet of leather. If, however, the cutter cuts the dozen pairs of shoes out of thirty-seven feet, our record shows that thirty-eight feet were allowed and that the cutter gained one foot. If twenty-five cent leather were used, there would be an actual money loss of twenty-five cents. The cutter is not in any way responsible for this loss. It was occasioned simply because the sizes and widths were larger than the average upon which the cost of the shoes was estimated.

A tabulation of all cutters' slips shall be made, using this form (No. 2), showing the gain or loss of the cutting room for each day.

This shall be continued each day, accumulating totals until the end of a period, when the following records shall be made:

First, the period results of each individual cutter.

Second, the period results of all cutters combined.

Third, a balance sheet from the ledger, showing the total amount debited and credited, the balance on hand, and the profit or loss on each kind or lot of leather. Additional forms will be necessary, such as Form No. 5 for record of the cost of stock used for cripple shoes, and Form No. 6 for the record of cost of linings.

There are two simple ways of handling lining records, either of which is satisfactory. One is to standardize linings and cut them by weight, the other is to charge each day all lining stock given to the lining cutting department and

credit department with the production, charging to loss or gain the difference.

In addition, if tongues, stays, facings, etc., are cut, instead of being bought, forms must be provided for them, but none are shown herewith.

Report No. 1, shown in Chapter 7, gives a condensed result of the operations in upper material for the fourth period of five weeks, ending February 1, 1913.

In the division of store department, under Bottom Cost, shall be kept all uncut sole leather, outer soles, inner soles, taps, counters, box toes, welting, heels, toplifts, etc.

Form No. 7 shown herewith may be used as a ledger, and is so designed that it will cover raw stock or cut stock. It also shows sales and gains or losses made by manufacturing or selling.

Form No. 8 may be used for sole cutting records.

Another form must be provided for sorting so that quality, irons and sizes may be shown, with such other data as is required. If a perpetual inventory of cut stock is kept, it will be debited directly from these sorters' slips.

Form No. 9 is a requisition slip for all of the material required from the store department for a given day's work. This sheet is filled out by a clerk and turned over to the store department to issue to the factory. In all cases where the particular article ordered is not supplied, in the column headed "Substituted" is entered the number of pairs changed, together with the gain or loss by the substitution. It is the only gain or loss which this sheet can show.

The results of this sheet may be carried each day to a perpetual inventory record, and shall be carried to a final report for the period. (See Report No. 2, Chapter 7.)

The store ledgers for supplies, findings, special findings,

RECEIVED								
DATE	AMOUNT	VALUE	DATE	AMOUNT	VALUE	DATE	AMOUNT	VALUE

NAME OF STOCK OR CUTTER

(Form No. 2)

NO.

SEASON

PRICE

LEATHER & CUTTERS RECORD

146-B Small, Nichols & Co., Inc., 183 Essex St., Boston.

		DISBURSED			FEET				MONEY				LABOR				WEEKLY
DATE	SLIP NO.	NAME STK. OR CUT	PATTERN NO.	PRS.	TAKEN	ALLOWED	GAIN	LOSS	COST	ALLOWED	GAIN	LOSS	GAIN	LOSS			PAY

Form No. 3

Stock Tag No. 15A. Small, Nichols & Co., Inc. No. 2385-1-170.

LOT NO. DATE

FROM THEIR MARK

KIND OUR MARK

DOZENS CASES OR SIDES FEET PRS. OR POUNDS PRICE

SLIP NO.	GIVEN OUT	RETURNED	USED

(51)

TIME STARTED

DATE

UPPER CUTTING SLIP

No. 1903

(Form No. 4)

TIME FINISHED

LABOR	FEET	MONEY
NAME	KIND	BOUGHT OF
NO.	LOT NO.	PRICE
TIME	GIVEN	GROSS CUT
RATE	RET'D	VALUE OFFAL
COST	USED	NET COST
KIND OFFAL	ALLOW	ALLOW	ALLOW
VALUE PER LB.	GAIN	GAIN	GAIN
TOTAL VALUE	LOSS	LOSS	LOSS

CASE NO.	PRS.	WD.	QUAL.	PAT. NO.	PATTERN	COMBINATION	INDEX	FEET ALLOW.	MONEY ALLOW.
PARTS									

(Form No. 5)

CUTTING DEP'T—CRIPPLE SHOES

NO. CC 52

Stock | Price | COST

Feet Used | Lot No. | ALL

Cutter | GAIN

Taken | Returned | LOSS

CASE No.	CRIPPLE No.	SAMPLE No.	PATTERN No.	Vamp	Fox	Tip	Qtr.	Lace Stay	Butt Fly	Back Stay	Qtr. Lin.	Butt. Fly Lin.	Eye Stay	Tong		CHARGE Dep.	CHARGE Op.	AMOUNT

No. L

DAILY LINING REPORT

(Form No. 6)

OUR MARK														
BILL NOS.														
TRADE MARK														
YARDS														
PRICE PER YD.														
COST														

Total Cost Charge to Cost of Production

PAIRS	OUR MARKS	ALLOWANCE PER 100 PR.		ALLOWANCE		TOTAL ALLOWANCE		
	TOTAL PAIRS & ALLOWANCE							
	LEATHER LININGS OR TO PROVE SHEET							
	TOTAL PAIRS ON SHEET							
	DOUBLERS							
	GAIN							
	LOSS							

2122-94-186 Small, Nichols & Co., Inc., Boston.

(Form No. 7)

SOLE LEATHER LEDGER

ARTICLE

FIGURED VALUE

RECEIVED				DISBURSED			BALANCE		RESULT	
DATE	QUANTITY	PRICE	VALUE	DATE	QUANTITY	VALUE	QUANTITY	VALUE	GAIN	LOSS

SOLE LEATHER CUTTERS SLIP № 6

(Form No. 8)

CUTTER	NO.	DATE
OUR MARK	PURCHASED FROM	LOT NO. / COST PER
TIME STARTED	LBS. GIVEN	LBS. REMNANTS
TIME FINISHED	LBS. RETURNED	LBS. REMNANTS

KIND	QUAL											TOTAL	

PAID	NET TIME	LBS. USED	PRICE USED	VALUE REMNANTS
ALLOW.	PAID PER HR.	LBS. ALLOW.	PRICE ALLOW.	VALUE REMNANTS
GAIN		GAIN	GAIN	
LOSS		LOSS	LOSS	

Sheet No._____ DAILY REPORT OF TOTAL BOTTOM COST

(Form No. 9)

2123-94-136 SMALL, NICHOLS & CO., Inc., Boston.

Date	Pairs Substituted	Price	Allowance	Cost	Gain	Loss
Prs. O. S. @						
" " " "						
" " " "						
" " " "						
" " " "						
Total O. Soles						
Prs. Slips @						
Prs. Mid. S. @						
Prs. In. S. @						
" " " "						
" " " "						
Total In. Soles						
Prs. Heels @						
" " "						
" " "						
" " "						
" " "						
Total Heels						
Prs. Top Lifts @						
" " " "						
Total Top Lifts						
Total Bot. Cost						

stationery, machine parts, tools, etc., shall be similar to Form No. 10.

Form No. 11 shall be supplied to each department in blocks with carbon duplicates, so that a requisition when filled out may be readily traced if lost.

Each department shall be known by a key number as follows:

Cutting	Department —	1001
Stitching	"	2001
Sole Leather	"	3001
Bottoming	"	4001
Finishing	"	5001
Packing	"	6001
Shipping	"	7001
Office	"	8001
Power	"	9001

These requisitions shall before being issued be numbered consecutively, using the keyed numbers as 1001, 1002, 1003.

Each department by this method will have an opportunity to use 999 slips, when the numbers shall be repeated.

The best results can be obtained, especially in the accounting part of the work, by requiring the foreman of each department, so far as possible, to make a requisition each Saturday for his wants to be delivered the following Monday.

These Forms No. 11 should be posted daily on Ledger Form No. 10, entering requisition number and quantity only.

At the end of each Period the disbursements of the ledger shall be extended and the ledger balanced.

After the ledger has been balanced, a trial balance should be drawn on to Form No. 12, which is called "Stock Room Report."

Thus the exact amount of material charged to each department is shown, and from the report of the shoes produced by each department will be found the actual cost to

compare with the estimates. (See Condensed Reports, Numbers 3, 4 and 5, in Chapter 7.)

Results of Productive Labor shall be shown on Form No. 13. The output of each department shall be entered daily thereon, and the actual costs found from the weekly payroll. A similar form will be used for cumulative figures. (See Report No. 6, Chapter 7, for condensed results of the operations of the fourth period.)

As the shoes are packed and ready to ship, copies of the production sheets shall be handed to a clerk for entry on a Production Record, Form No. 14. The totals of these sheets will be used for many purposes, but chiefly to get the various debits and credits which will be made to show the values of all assets and the total of estimated profits.

Many percentage figures can be made from the above totals, and the reader is referred to Chapter 8 for details.

Exhibit No. 7 shows the daily production records of shoes entering the works. The end of Period 4 was February 1, 1913, or work day No. 106. There had been entered at that date 315,089 pairs of shoes, of which 261,125 pairs had been packed, or all production sheets up to and including work day No. 88.

The total value of these shoes at selling prices was $658,035.

The last sheet was put into the factory March 21, 1913, and was work day No. 146.

The total output for twenty-six weeks was 417,933 pairs or 17,993 pairs more than the estimate.

Chapter 7 is devoted to the reports of the business at close of Period No. 4.

NUMBER

SHELF OR BIN NO.

DEPT. USING

ARTICLE (Form No. 10)

DES.

FIGURED PRICE

UNIT

MAX.

MIN.

ORDERED			RECEIVED				DISBURSED				BALANCE		RESULTS		
DATE	QUANTITY	PRODU.	DATE	QUANTITY	PRICE	VALUE	REQUI-SITION	DEPT.	QUANTITY	VALUE	VALUE	QUANTITY	GAIN	LOSS	%

(Form No. 11) 55 Small, Nichols & Co., Inc., Boston

.....19

Please deliver to me the following articles:

Quantity	Unit	ARTICLE	Date Wanted	Filled

Signed by.....**Foreman**

Dept. No.

STOCK ROOM REPORT

(Form No. 12)

129 Small, Nichols & Co., Inc., Boston 2287-1-30

RECEIVED		DEPARTMENT DISBURSEMENTS											BALANCE	PURCHASING	
ARTICLE	PURCHASE VALUE	1	2	3	4	5	6	7	8	TOTAL TO DEP'TS	RET'D OR SOLD	TOTAL DISBURSED		GAIN	LOSS
Forward															

Sheet No. _____

DAILY DEPARTMENT PRODUCTION RECORD

(Form No. 13)

BY DEPARTMENTS

	Date		Cutting		Stitching		Stock Fitting		Lasting		Bottoming		Finishing		Packing				
For Week Ending																			
Total for Week																			
Piece Labor Pay Roll																			
" " Avg. Per Pair																			
Day " Pay Roll																			
" " Avg. Per Pair																			

(Form No. 14)

Fact. Cost		**Sell. Cost**		**Sample or Group No.**
Sell. Exp.		**Sell. Price**		
Sell. Disc.		**Fig. Profit**		

	Period 1		Period 2		Period 3		Period 4		Period 5		Period 6	
	Date or Sheet No.	Pairs	Date or Sheet No.	Pairs	Date or Sheet No.	Pairs	Date or Sheet No.	Pairs	Date or Sheet No.	Pairs	Date or Sheet No.	Pairs
Total Pairs												
" Fact. Cost												
" Sell. Exp.												
" " Disc.												
" " Cost												
" " Price												
" Fig. Profit												
	PRODUCTION RECORD											
	SEASON OF											

2195-94-186, Small, Nichols & Co., Inc., Boston.

EXHIBIT No. 7

DAILY SCHEDULE OF SHOES ENTERED INTO THE WORKS; TWO SHEETS EACH DAY EXCEPT SATURDAYS, WHEN ONLY ONE WAS PUT IN

	PERIOD NO.	WORK DAY NO.	DATES	PAIRS
	1	1	Sept. 30	2,650
	1	2	Oct. 1	2,750
	1	3	" 2	2,900
	1	4	" 3	3,000
	1	5	" 4	3,040
	1	6	" 5	1,527
	1	7	" 7	3,156
	1	8	" 8	3,160
	1	9	" 9	3,140
	1	10	" 10	3,138
	1	11	" 11	3,134
	1	12	" 12	1,572
	1	13	" 14	3,290
	1	14	" 15	3,284
	1	15	" 16	3,278
	1	16	" 17	3,294
	1	17	" 18	3,236
	1	18	" 19	1,638
	1	19	" 21	3,300
	1	20	" 22	3,294
	1	21	" 23	3,286
	1	22	" 24	3,274
	1	23	" 25	3,258
	1	24	" 26	1,642
	1	25	" 28	3,273
	1	26	" 29	3,278
	1	27	" 30	3,270
	1	28	" 31	3,264
	1	29	Nov. 1	3,281
	1	30	" 2	1,636
Half Day Average, 1,586		Total		87,243

	PERIOD NO.	WORK DAY NO.	DATES	PAIRS
	2	31	Nov. 4	3,290
	2	32	" 5	3,286
	2	33	" 6	3,280
	2	34	" 7	3,292
	2	35	" 8	3,295
	2	36	" 9	1,644
	2	37	" 11	3,278
	2	38	" 12	3,282
	2	39	" 13	3,276
	2	40	" 14	3,270
	2	41	" 15	3,278
	2	42	" 16	1,640
	2	43	" 18	3,288
	2	44	" 19	3,290
	2	45	" 20	3,282
	2	46	" 21	3,284
	2	47	" 22	3,290
	2	48	" 23	1,650
	2	49	" 25	3,322
	2	50	" 26	3,316
	2	51	" 27	3,318
	2	52	" 29	3,334
	2	53	" 30	1,662
Half Day Average, 1,608		Total		69,147
		"	to date	156,390

	PERIOD NO.	WORK DAY NO.	DATES	PAIRS
	3	54	Dec. 2	3,266
	3	55	" 3	3,270
	3	56	" 4	3,260
	3	57	" 5	3,265
	3	58	" 6	3,272
	3	59	" 7	1,633
	3	60	" 9	3,270
	3	61	" 10	3,280
	3	62	" 11	3,268
	3	63	" 12	3,274
	3	64	" 13	3,258
	3	65	" 14	1,638
	3	66	" 16	3,268
	3	67	" 17	3,278
	3	68	" 18	3,266
	3	69	" 19	3,270
	3	70	" 20	3,260
	3	71	" 21	1,634
	3	72	" 23	3,328
	3	73	" 24	3,322
	3	74	" 26	3,334
	3	75	" 27	3,328
	3	76	" 28	1,664
Half Day Average, 1,640		Total		68,906
		"	to date	225,296

	PERIOD NO.	WORK DAY NO.	DATES	PAIRS
	4	77	Dec. 30	3,249
	4	78	" 31	3,254
	4	79	Jan. 1	3,246
	4	80	" 2	3,242
	4	81	" 3	3,255
	4	82	" 4	1,624
	4	83	" 6	3,266
	4	84	" 7	3,270
	4	85	" 8	3,262
	4	86	" 9	3,260
	4	87	" 10	3,269
	4	88	" 11	1,632
	4	89	" 13	3,274
	4	90	" 14	3,280
	4	91	" 15	3,272
	4	92	" 16	3,270
	4	93	" 17	3,278
	4	94	" 18	1,638
	4	95	" 20	3,276
	4	96	" 21	3,282
	4	97	" 22	3,270
	4	98	" 23	3,278
	4	99	" 24	3,268
	4	100	" 25	1,638
	4	101	" 27	3,262
	4	102	" 28	3,270
	4	103	" 29	3,264
	4	104	" 30	3,263
	4	105	" 31	3,251
	4	106	Feb. 1	1,630
Half Day Average, 1,632		Total		89,793
		"	to date	315,089

	PERIOD NO.	WORK DAY NO.	DATES	PAIRS
	5	107	Feb. 3	3,254
	5	108	" 4	3,252
	5	109	" 5	3,263
	5	110	" 6	3,248
	5	111	" 7	3,252
	5	112	" 8	1,627
	5	113	" 10	3,264
	5	114	" 11	3,256
	5	115	" 12	3,248
	5	116	" 13	3,254
	5	117	" 14	3,274
	5	118	" 15	1,630
	5	119	" 17	3,318
	5	120	" 18	3,314
	5	121	" 19	3,322
	5	122	" 20	3,319
	5	123	" 21	1,659
	5	124	" 24	3,238
	5	125	" 25	3,234
	5	126	" 26	3,240
	5	127	" 27	3,232
	5	128	" 28	3,240
	5	129	Mar. 1	1,618
Half Day Average, 1,632		Total		68,556
		"	to date	383,645

	PERIOD NO.	WORK DAY NO.	DATES	PAIRS
	6	130	Mar. 3	2,570
	6	131	" 4	2,568
	6	132	" 5	2,572
	6	133	" 6	2,564
	6	134	" 7	2,568
	6	135	" 8	1,284
	6	136	" 10	2,220
	6	137	" 11	2,216
	6	138	" 12	2,224
	6	139	" 13	2,226
	6	140	" 14	2,214
	6	141	" 15	1,110
	6	142	" 17	1,600
	6	143	" 18	1,612
	6	144	" 19	1,600
	6	145	" 20	1,600
	6	146	" 21	1,600
Half Day Average, 1,073		Total		34,348
Half Day Average for Season, 1,553.8		"	to date	417,993

Chapter 7

DETAILED REPORTS

THE reports indexed below are tabulated from the daily and weekly figures, and show the condition of the business at the end of Period No. 4.

Report	No.	1.	Upper Material
"	"	2.	Bottom "
"	"	3.	Supplies "
"	"	4.	Findings "
"	"	5.	Excess Findings "
"	"	6.	Productive Labor
"	"	7.	Non-Productive Labor
"	"	8.	Operative Expense, Royalty and Depreciation
"	"	9.	Distributive Expense
"	"	10.	Complete Cost Statement — Report of Above-Mentioned Period
"	"	11.	Copy of Trial Balance
"	"	12.	Balance Sheet

REPORT No. 1

Upper Material

For Period No. 4. Beginning Dec. 30, 1912 and ending Feb. 1, 1913.

WORK DAY	PAIRS CUT	ESTIMATE	COST	GAINS	LOSSES
77	3,249	$2,238.94	$2,229.58	$9.36	
78	3,254	2,228.17	2,225.10	3.07	
79	3,246	2,246.93	2,231.80	15.13	
80	3,242	2,234.20	2,227.69	6.51	
81	3,255	2,240.45	2,241.73		$1.28
82	1,624	1,111.88	1,110.73	1.15	
83	3,266	2,251.86	2,236.86	15.00	
84	3,270	2,260.79	2,236.34	24.45	
85	3,262	2,224.27	2,226.12		1.85
86	3,260	2,236.91	2,238.35		1.44
87	3,269	2,244.01	2,237.57	6.44	
88	1,632	1,125.42	1,115.35	10.07	
89	3,274	2,246.40	2,244.54	1.86	
90	3,280	2,252.68	2,244.74	7.94	
91	3,272	2,253.26	2,239.29	13.97	
92	3,270	2,242.79	2,233.86	8.93	
93	3,278	2,261.40	2,251.29	10.11	
94	1,638	1,128.59	1,121.24	7.35	
95	3,276	2,244.11	2,246.21		2.10
96	3,282	2,262.03	2,248.08	13.95	
97	3,270	2,242.76	2,247.82		5.06
98	3,278	2,260.39	2,252.25	8.14	
99	3,268	2,243.40	2,244.82		1.42
100	1,638	1,132.55	1,130.57	1.98	
101	3,262	2,230.36	2,238.56		8.20
102	3,270	2,254.29	2,249.30	4.99	
103	3,264	2,238.75	2,244.41		5.66
104	3,263	2,243.87	2,237.26	6.61	
105	3,251	2,236.67	2,229.35	7.32	
106	1,630	1,121.97	1,114.84	7.13	
Totals	89,793	$61,740.10	$61,575.65	$191.46	$27.01
		61,575.65		27.01	
Net Gain		$164.45		$164.45	
Buying and Sorting				$1,274.34	
Total Gain				$1,438.79	

These figures are entered day by day and totaled at end of period.

REPORT No. 2

BOTTOM MATERIAL

For Period No. 4. Beginning Dec. 30, 1912, and ending Feb. 1, 1913.

WK. DAY	PAIRS	ESTIMATE	COST	GAINS	LOSSES
70	3,260	$1,824.63	$1,818.33	$6.30	
71	1,634	901.56	905.11		$3.55
72	3,328	1,854.49	1,855.44		.95
73	3,322	1,858.25	1,850.20	8.05	
74	3,334	1,864.05	1,857.11	6.94	
75	3,328	1,851.49	1,854.93		3.44
76	1,664	925.24	926.32		1.08
77	3,249	1,819.08	1,816.40	2.68	
78	3,254	1,812.93	1,803.96	8.97	
79	3,246	1,815.82	1,805.31	10.51	
80	3,242	1,815.26	1,809.78	5.48	
81	3,255	1,810.88	1,813.93		3.05
82	1,624	912.53	906.59	5.94	
83	3,266	1,819.07	1,823.19		4.12
84	3,270	1,831.21	1,826.61	4.60	
85	3,262	1,817.81	1,820.00		2.19
86	3,260	1,827.72	1,822.84	4.88	
87	3,269	1,819.41	1,823.42		4.01
88	1,632	914.28	909.05	5.23	
89	3,274	1,828.53	1,824.10	4.43	
90	3,280	1,826.80	1,821.15	5.65	
91	3,272	1,827.96	1,821.46	6.50	
92	3,270	1,825.60	1,815.94	9.66	
93	3,278	1,831.15	1,824.17	6.98	
94	1,638	916.90	913.64	3.26	
95	3,276	1,825.34	1,827.13		1.79
96	3,282	1,834.63	1,829.99	4.64	
97	3,270	1,823.42	1,817.39	6.03	
98	3,278	1,832.86	1,824.24	8.62	
99	3,268	1,819.98	1,823.18		3.20
Totals	90,085	$50,288.88	$50,190.91	$125.35	$27.38
		50,190.91		27.38	
Net Gain		$97.97		$97.97	
Buying, Cutting and Sorting				$1,633.62	
Total Gain				$1,731.59	

These figures are made day by day and only require to be totaled at end of month.

REPORT No. 3

Supplies Material

For Period No. 4. Beginning Dec. 30, 1912, and ending Feb. 1, 1913.

Articles	Operating				Buying	
	estimate	cost	gain	loss	gain	loss
Buttons	$49.84	$49.84				
Cartons, Case and Tissue	3,141.91	3,096.42	$44.49			
Eyelets and Hook	1,781.02	1,770.06			$10.96	
Heel Pads	224.42	220.20			4.22	
Inside Labels	445.60	404.50			41.10	
Lace or Ribbons	897.69	926.00				$26.31
Pull Straps	534.00	527.40			6.60	
Shanks	425.80	420.32			4.48	
	$7,500.28	$7,414.74	$44.49		$67.36	$26.31
					26.31	
	7,414.74		41.05		$41.05	
Net Profit	$85.54		$85.54			

This buying profit is not treated as on Reports Nos. 1 and 2, because our estimates are not made on a sorting basis. Figures drawn from Store Department Report, see Form No. 12.

REPORT No. 4

Findings Material

For Period No. 4. Beginning Dec. 30, 1912, and Ending Feb. 1, 1913.

DEPARTMENTS	ESTIMATE	COST	GAIN	LOSS
Cutting	$90.03	$82.87	$7.16	
Stitching	1,125.84	1,014.85	110.99	
Stock Fitting	378.28	392.06		$13.78
Lasting	1,215.93	1,169.85	46.08	
Bottoming	3,178.62	2,983.71	194.91	
Finishing	405.24	428.08		22.84
Packing	450.19	468.05		17.86
Totals	$6,844.13	$6,539.47	$359.14	$54.48
	6,539.47		54.48	
Net Gain	$304.66		$304.66	

Figures drawn from Store Department Report, see Form No. 12.

REPORT No. 5

Excess Findings Material

For Period No. 4. Beginning Dec. 30, 1912, and ending Feb. 1, 1913.

DEPARTMENTS	ESTIMATE	COST	GAIN	LOSS
Stitching	$226.52	$212.82	$13.70	
Packing	267.40	255.90	11.50	
Totals	$493.92 468.72	$468.72	$25.20	
Net Gain	$25.20		$25.20	

Figures drawn from Store Department Report, see Form No. 12.

REPORT No. 6

Productive Labor

For Period No. 4. Beginning Dec. 30, 1912, and ending Feb. 1, 1913.

DEPARTMENTS	ESTIMATE	COST	GAIN	LOSS
Cutting	$5,176.89	$5,043.44	$133.45	
Stitching	8,520.34	8,365.66	154.68	
Stock Fitting	1,107.82	1,094.12	13.70	
Lasting	4,503.45	4,593.02		$89.57
Bottoming	19,368.89	19,123.97	244.92	
Finishing	3,259.92	3,077.28	182.64	
Packing	2,476.05	2,578.37		102.32
Totals	$44,413.36	$43,875.86	$729.39	$191.89
	43,875.86		191.89	
Net Gain	$537.50		$537.50	

Figures drawn from Labor Report, see Form No. 13.

REPORT No. 7

Non-Productive Labor

For Period No. 4. Beginning Dec. 30, 1912, and ending Feb. 1, 1913.

DIVISIONS	ESTIMATE	COST	DECREASE	INCREASE
Executive	$1,450.00	$1,450.00		
Superintendence	1,765.00	1,788.00		$23.00
Office	750.00	875.00		125.00
Sundries	405.00	425.00		20.00
	$4,370.00	$4,538.00		$168.00
	4,538.00			
Net Increase	$168.00			$168.00

Total Pairs Packed 90,038 Estimate $5.68 per 100 pairs,	$5,114.16	$5,114.16
Net Gain for Period		$576.16

Note: The estimate was actually increased by $168.00 while the production increased 13,118 pairs. Figured at $5.68 per hundred = $745.10. Deduct $168.00 and balance left = $577.10. The difference of 94 cents is caused by not carrying three decimal places.

REPORT No. 8

Operative Expense, Royalty and Depreciation

For Period No. 4. Beginning Dec. 30, 1912, and ending Feb. 1, 1913.

DIVISIONS	ESTIMATE	COST	DECREASE	INCREASE
Rent	$865.39	$865.39		
Taxes	384.61	384.61		
Insurance	288.46	279.85	$8.61	
Interest	769.23	731.15	38.08	
Power and Heat	384.61	372.00	12.61	
Freight and Express	1,153.85	1,127.82	26.03	
Water, Light, Tel., etc.	192.31	185.10	7.21	
Machinery Repairs	769.23	715.90	53.33	
Factory Equip. Repairs	192.31	209.80		$17.49
Extra Cost of Samples	384.61	354.60	30.01	
Office Supplies	576.92	544.25	32.67	
Sundries	384.61	317.31	67.30	
Shoe Loss Allowance	1,346.15	956.28	389.87	
Totals	$7,692.29	$7,044.06	$665.72	$17.49
	7,044.06		17.49	
Net Decrease	$648.23		$648.23	
Total Pairs Packed 90,038 Estimate at 10c.	$9,003.80	$9,003.80		
Net Gain for Period		$1,959.74		

Note: The estimate was actually reduced by $648.23, while the production output went from the estimate 76,920 to 90,038, equal to a gain of $1,311.80 plus the $648.23 = $1,960.03. The difference of 29 cents is caused by not carrying out all figures in three decimal places.

The estimate was beaten in two ways, more output and less cost.

Royalty	$5,161.20	$5,161.20. No gain or loss considered.
Depreciation	4,501.90	3,846.00. Gain = $655.90.

REPORT No. 9

Distributive Expense

For Period No. 4. Beginning Dec. 30, 1912, and ending Feb. 1, 1913.

DIVISIONS	ESTIMATE	COST	DECREASE	INCREASE
Selling Labor	$1,375.00	$1,390.00		$15.00
Advertising	3,846.15	3,820.12	$26.03	
Mercantile Agencies, etc.	192.31	200.00		7.69
Sundries	355.77	320.16	35.61	
Totals	$5,769.23	$5,730.28	$61.64	$22.69
	5,730.28		22.69	
Net Decrease	$38.95		$38.95	

Total Pairs Shipped
Same as Packed 90,038

at 7½ cents each	$6,752.85	$6,752.85
Gain for Period		1,022.57
Bad Debts Loss .500%	1,131.09	922.06
Gain		209.03
Salesmen's Costs	12,441.98	12,976.70
Loss	534.72	

The sales figured $226,217.88. The average price therefore was $2.51¼ per pair. Discount figured on this amount.

Total Distributive was as follows:

Gain on Expense		$1,022.57
" " Bad Debts		209.03
Loss " Salesmen's Cost	$534.72	
Net Gain	696.88	
	$1,231.60	$1,231.60
Discount 2%	$4,524.36	$3,860.75. Gain $663.61

Discount saved on accounts paid net is deducted from the estimate at 2%, and is a gain.

REPORT No. 10

COMPLETE COST STATEMENT

For Period No. 4. Beginning Dec. 30, 1912, and ending Feb. 1, 1913.

FROM REPORTS	PRODUCING AND DISTRIBUTING				SORTING	
	ESTIMATE	COST	GAIN	LOSS	GAIN	LOSS
No. 1. Upper Ma- Material	$61,740.10	$61,575.65	$164.45		$1,274.34	
" 2. Bottom Material	50,288.88	50,190.91	97.97		1,633.62	
" 3. Supplies Material	7,500.28	7,414.74	85.54			
" 4. Findings Material	6,844.13	6,539.47	304.66			
" 5. Excess Fdgs. Ma.	493.92	468.72	25.20			
Total Material	$126,867.31	$126,189.49	$677.82		$2,907.96	
Purchase Disc. 4%	5,100.98	5,079.29		$21.69		
Net. Mat. Totals	$121,766.33	$121,110.20	$656.13		$2,907.96	
No. 6. Productive Labor	44,413.36	43,875.86	537.50			
" 7. Non-Prod. Labor	5,114.16	4,538.00	576.16			
" 8. Operative Expense	9,003.80	7,044.06	1,959.74			
" 8. Royalty	5,161.20	5,161.20				
" 8. Depreciation	4,501.90	3,846.00	655.90			
Manufacturing Complete	$189,960.75	$185,575.32	$4,385.43		$2,907.96	
Total Manufacturing Gain or Loss			$7,293.39			
No. 9. Distrib't'e Expenses	6,752.85	5,730.28	1,022.57			
" 9. Bad Debts Losses	1,131.09	922.06	209.03			
" 9. Salesmen's Costs	12,441.98	12,976.70		$534.72		
" 9. Discount	4,524.36	3,860.75	663.61			
Total Distributive	$24,850.28	$23,489.79	$1,895.21	$534.72		
Net Distributive Profit			1,360.49			
Net Total Profit			$8,653.88			
Profits drawn from Figuring Sheets (See Form No. 1)			$11,672.88			
Total Gain for Period No. 4			$ 20,326.76			

This period was used partly because it should show a greater profit than any other period, except Period No. 5. Periods 1 and 6 are liable to show losses because of small output.

REPORT No. 11

Copy of Trial Balance

For Period No. 4. Beginning Dec. 30, 1912, and ending Feb. 1, 1913.

ACCT. NO.	ACCOUNT NAMES	DEBITS	CREDITS
101	Capital Stock		$600,000.00
102	Surplus		63,309.85
103	Reserves for Machinery and Equipment Depreciation		89,175.60
104	Reserves for Shrinkage of Accounts Receivable		2,464.10
105	Notes Payable		180,000.00
106	Accounts Payable		12,219.50
107	Discounts Anticipated on Accounts Receivable		12,430.82
108	Discounts on Raw Merchandise Used		7,471.93
201	Cash in Banks	$54,632.80	
202	" " Office	500.00	
203	Accounts Receivable Ledgers	553,915.96	
204	Personal Accounts	9,666.84	
205	Notes Receivable	6,460.00	
206	Stores Department Upper Ledger	69,121.22	
207	" " Bottom Ledger	67,238.14	
208	" " Sundries Ledger	27,525.75	
209	Goods in Process	77,571.37	
210	Finished Shoes and Sales		
211	Returned and Damaged Shoes	2,274.30	
212	Machinery	76,221.83	
213	Equipment and Fixtures	21,636.75	
214	Lasts, Sole Patterns and Dies	25,223.92	
215	Upper Patterns and Dies	10,768.77	
216	Labor Productive		
217	" Non-Productive		
218	Insurance	194.51	
219	Interest	2,993.38	
220	Taxes	2,514.50	
221	Discounts Anticipated on Accounts Payable	588.78	
301	Operative Expenses		
302	Administrative Expenses	1,013.26	
303	Distributive Expenses		
401	Operation Gain and Loss		10,625.91
402	Distribution Gain and Loss	2,319.56	
403	Figured Profit		34,683.93
404	Final Gain and Loss		
	Totals	$1,012,381.64	$1,012,381.64

REPORT No. 12

BALANCE SHEET

For Period No. 4. Ending Feb. 1, 1913.

ASSETS

QUICK ASSETS:		
Cash	$55,132.80	
Accounts Receivable — Less Discounts and Reserves	539,021.04	
Notes Receivable	6,460.00	
Raw Merchandise — Less Discounts	156,413.18	
Returned and Damaged Shoes, Net	2,274.30	
Shoes in Process, Net	77,571.37	
Total Quick Assets		$836,872.69
INVESTMENT:		
Machinery and Equipment		133,851.27
DEFERRED ASSETS:		
Personal Accounts Receivable	$9,666.84	
Prepaid Items	5,702.39	
Total Deferred Assets		15,369.23
Total Assets		$986,093.19

LIABILITIES

CURRENT LIABILITIES:		
Notes Payable	$180,000.00	
Accounts Payable Net	11,630.72	
Total Current Liabilities		$191,630.72
Capital	$600,000.00	
Surplus	63,309.85	
Depreciation	89,175.60	
Net Profit to Date 6.3% on Sales	41,977.02	
Total Capital		794,462.47
Total Liabilities		$986,093.19
Net Quick Assets	$625,241.97	

Chapter 8

PERCENTAGE ESTIMATES

AS stated in Chapter 4, control over a shoe manufacturing business may be exercised by using a simple percentage cost system. It may be based upon Total Manufacturing Cost, Total Cost, or Selling Price. (See Form No. 1, or Exhibit No. 8.)

It will not be wise for the writer to attempt to make a mandatory rule as a guide for the construction of such a system. Each manufacturing business must be considered independently, and the base to be used chosen after full knowledge of certain conditions has been acquired.

In arranging a system where the variation from the average price is as slight as in the illustration used in the foregoing chapters, it will be immaterial whether the base used is the Total Cost or the Selling Price.

The Selling Price was used in these illustrations for several reasons, two of which are given below.

First, because all shoes were to be estimated on a profit basis of a fixed per cent.

Second, because the cheapest shoes were $2.40 and the highest $2.60, but practically all shoes were $2.50.

On Exhibit No. 8 the average price is shown for the season as $2.50½, and the net profit was 6.593%. The total net profit after deducting $2,000 for administrative expenses was $69,043.87, or $9,043.87 more than the estimate. (See Exhibit No. 1.)

To illustrate more clearly the percentage method, the reader's attention is called to the "Total Upper Cost," which was for the season 27% of the average Selling Price. The first day of the season the cutting department was started with 2,650 pairs, the sales value being at $2.50 per pair, $6,625. The cutting department material estimate at 27% was therefore $1,788.75. The report of that day's work shows the actual cost to have been $1,792.85 or a loss from the estimate of $4.10. The basis of the allowance for the shoes, estimated on Form No. 1, allowed a possible increase of a little less than one-half of one per cent on the selling price, to be exact, .00453+. Therefore, the cutting department costs could have been proved at the end of a period by figuring cost of total material used against selling price, and the approximate profit or loss could have been easily determined. If the cost had in this case exceeded 27½%, losses would have been accumulating.

To compile statistics of gains and losses, it is only necessary to figure the per cent of increase or decrease.

The 27% can be divided so as to get the *pro rata* of outside, lining and trimming, if desired.

The sole and all other parts of the shoe can be treated in the same manner. A careful analysis of Exhibit No. 8, by a manufacturer or accountant, will suggest ways to keep costs without much clerical expense. *It is ridiculous — the immense amount of money being spent by some manufacturers for cost keeping.* There is no method known of making comparative statistics equal to the percentage method. Facts can be brought out regarding a business for a period of years or for a number of concerns for any period desired.

As stated in Chapters 1 and 2, comparative statistics are very difficult to get because there is no uniformity in methods of accounting.

On Exhibit No. 8 appears "Excess Findings" at 50 cents per hundred pairs, but no figures are used in the detailed estimate on Form No. 1. That particular shoe did not carry an allowance. The basis was 25% of the product at $2.00 per hundred, consequently, in the general estimate it stood at 50 cents per hundred pairs.

EXHIBIT No. 8

FINAL REPORT OF ESTIMATES AND COSTS FOR THE SEASON BASED ON PER CENT

	ESTIMATES			COSTS		GAINS AND LOSSES	
	ESTIMATE SHEET FORM NO. 1	PER CENT OF SELLING PRICE	TOTAL ESTIMATE	ACTUAL COST	PER CENT OF SELLING PRICE	PER CENT GAIN OR LOSS	TOTAL GAIN OR LOSS
Total Upper Cost	.6877	27.453+	$287,453.79	$282,709.56	27.000	0.453+	$4,744.23
" Bottom Cost	.5585	22.295+	233,449.09	230,355.95	22.000	0.295+	3,093.14
" Supplies Cost	.0810	3.234—	33,857.43	32,982.78	3.150	0.084—	874.65
" Findings Cost	.0660	2.635+	27,587.54	26,752.70	2.555	0.080—	834.84
" Excess Findings Cost	.0050	0.200	2,089.96	1,884.73	0.180	0.020	205.23
" Material Cost	1.3982	55.817	$584,437.81	$574,685.72	54.885	0.932+	$9,752.09
" Purchase Discount 4%	.0559	2.231—	23,377.51	23,035.59	2.200	0.031*	341.92*
Net Material Cost	1.3423	53.586	$561,060.30	$551,650.13	52.685	0.901	$9,410.17
Total Productive Labor Cost	.4932	19.689—	206,154.15	205,749.74	19.650	0.039—	404.41
" Non-Productive Labor Cost	.0568	2.267+	23,742.00	22,616.77	2.160	0.107	1,125.23
" Depreciation Cost	.0500	1.996+	20,899.65	19,894.38	1.900	0.096	1,005.27
" Shoe Loss Cost	.0175	0.699—	7,314.88	6,491.85	0.620	0.079—	823.03
" Operative Expense Cost	.0825	3.293+	34,484.42	31,412.17	3.000	0.293	3,072.25
" Royalty Cost	.0575	2.295+	24,034.60	23,559.13	2.250	0.045	475.47
" Manufacturing Cost	2.0998	83.825—	$877,690.00	$861,374.17	82.265	1.560	$16,315.83
" Selling Expense Cost	.0715	2.854+	29,886.50	28,270.95	2.700	0.154	1,615.55
* " Salesmen's Expense, etc., Cost 6%	.1503	6.000	62,824.34	68,059.71	6.500	0.500*	5,235.37*
" Selling Discount 2%	.0501	2.000	20,941.45	18,323.77	1.750	0.250	2,617.68
" Administrative Expense Cost	.0048	0.192—	2,000.00	2,000.00	0.192		
" Cost	2.3765	94.871	$993,342.29	$978,028.60	93.407	1.464	$15,313.69
Average Selling Price	2.5050	100.000	1,047,072.47	1,047,072.47	100.000		
" Profit, etc.	.1285	5.129	$53,730.18	$69,043.87	6.593	1.464	$15,313.69
Pairs Produced	417,993						

*Loss deducted.

Percentage figures are carried out to only three digits; therefore small errors exist in the above.

Chapter 9

ACCOUNTING AND AUDITING

AFTER finishing with the accounting systems it seems appropriate to write a short chapter on the above subject and look at the relation of the Public Accountant to the shoe manufacturing business.

When the writer first began urging shoe manufacturers to employ public accountants, there were scarcely five states in the Union which conferred titles such as "Certified or Chartered Public Accountant."

This title has been very misleading to many Americans. They suppose it to be a guarantee of excellence and efficiency; that a holder of the title is possessed of all accounting knowledge and is efficient and honest in every respect.

As a matter of fact, there are Certified Public Accountants who have had no business experience and others who are not only inefficient, but dishonest.

It is a lamentable truth that many accountants are grafters. In fact, some of the largest auditing concerns in the country order their men to make a job last a certain length of time, and it is practically impossible to prove the charge when the grafting takes this form. An accountant who is a grafter is one of the most contemptible of all grafters, because of the peculiar position of trust he holds.

If it is deemed necessary that the state must protect the public by an examination and the granting of a certificate,

then it should grant two distinct titles, because there are two distinct classifications under which accountants should be recorded. These two classifications are Constructive Accountants or Industrial Engineers and Auditors.

The first and most important is the business counsel, who must be a broad gauge accountant, qualified to investigate or organize a business. He frequently does business under the title of Industrial Engineer, Efficiency Engineer, or Industrial Expert, etc. His ability and experience, as well as intelligence, must be of a higher order than that of an auditor. He may be a member of one or more Engineering Societies, or a member of the bar, with no accounting certificate from any state. Many manufacturers, following the advice of their bankers, employ mere auditors who have the title "C. P. A.," expecting them to render the service that the above-described men alone are qualified to give.

If in need of a superintendent, a shoe manufacturer will look for one in the factory of a successful competitor, and not in a textile mill. He should search for accountants and other outside advisers in the same way.

Some years ago, the writer was called in consultation by a shoe manufacturing company. The books had just been audited by a concern of auditors with an international reputation, recommended by bankers. The directors of the company said, "This report tells us we have lost $1,000 a month for the last year. Can you tell us where we lost it and why we lost it? This report does not have one single intelligent suggestion in it."

It was not a very difficult problem for an accountant who understood the shoe business to solve. By reading the report and asking a few questions, the fact was brought out that they were not figuring shoes correctly. They adopted the advice then given and have made money ever since.

Previously, bankers told them how to operate their business, even to the method of figuring shoes.

Ten years ago, the writer was before a bank committee regarding a client whose balance sheet was not very good. The bank was not disposed to extend any assistance to the concern, although in the same city with the manufacturer. The writer urged the bankers to grant all the credit possible and aid in every way they could, but they would not assist, and the concern had a hard time financing for years. One year ago the president of the bank wanted to know why I was so enthusiastic for my client. He admitted my judgment had been correct, but added, "You must admit their balance sheet was bad." It certainly was, but the banker judged entirely by a balance sheet, while I judged after investigating the factory, the *personnel* of the men in the organization, and the plan they had mapped out. To-day that concern can borrow a million if it so desires.

In shoe manufacturing there is a multitude of details and problems that only special training can arrange and solve in the best and simplest manner.

The second classification of accountants who should get a certificate from the state are Auditors.

In the state of Massachusetts, Savings Banks only are required to employ the services of "Certified Public Accountants."

Bank bookkeeping is the simplest form of all accounting. There is no complication to it equal to merchandise accounting.

Manufacturing accounting is even more complicated than merchandising, because in addition to all the detail of buying and selling, it has the vast detail required in the handling of raw merchandise and of the labor employed in the production of a finished article.

Bankers, by training and instinct, think more of Assets and Liabilities than they do of Constructive Accounting. Therefore, a "Destructive" auditor pleases the banker better than a "Constructive" accountant, because he pulls down all assets to bedrock.

There are several good reasons for employing honest and efficient auditors.

First: Because they should give valuable suggestions and therefore add profits to a business. The more experienced they are in an industry, the better their advice should be.

Second: Because the *personnel* of an office force is improved by the knowledge that an outsider is coming in from time to time to look over the work and compare it in his mind with that found in other places. Ambitious employees will constantly improve through contact with a man who stimulates them to be the best in their class.

Third: Because protective systems will be enforced and thus dishonesty will be prevented. To illustrate, the writer installed a system with a concern, and the books were audited each six months. The same owners conducted another small business in the same office, the books being kept by people who also worked on the books mentioned above. The owners said the second business was so small that no outside accountant was required on the books. Something went wrong and an audit was made which disclosed the fact that a girl who worked on both sets of books had stolen almost four thousand dollars from the unsystemized, unaudited business, and not a dollar from the systemized, audited business. One thousand dollars spent for this work would have insured the business for ten years at a saving of three thousand dollars.

Of course, inefficient or dishonest audits have been made

where stealing was not disclosed, but an honest, efficient auditor always finds a shortage if one exists. Dishonesty in bookkeepers, cashiers and clerks almost always is caused by the loose methods of an employer who leaves an opportunity open. Generally small amounts are taken at first.

No man has a moral right to create this opportunity when it is possible to prevent it.

Many business men are sick and do not know it. When they find it out they seek the doctor. Frequently they are too late.

After the above loss of four thousand dollars was discovered the owners said, "The horse has been stolen, now we will lock the door." They realized then that "an ounce of prevention is worth a pound of cure."

Fourth: Because a condition of confidence and good feeling will exist between the debtor and his creditors who will know that the debtor has nothing to conceal.

To sum up the value of Public Accountants to shoe manufacturers it may be said that the regular employees in most concerns are busy with the detail work of the business, and do not have the time to devote to unusual problems. Much time is required to think and work out new or improved ideas, and these employees should welcome the outside adviser.

These public men are clearing houses of business and office knowledge, and should have more diversified information than the regular employees. If the man is an intelligent instructor and ready to give all the assistance possible, he is a very valuable man to employ. He is constantly in communication with bright minds and continually absorbing new and valuable ideas.

Chapter 10

MACHINERY INVENTORY AND DEPRECIATION

A SHOE manufacturer has four standpoints from which to view machinery values. They are as follows:

First: Original Cost or Money Invested.

Second: Replacement Value in Case of Fire.

Third: The Value to a Live, Going Business.

Fourth: Forced Sale Value.

Some manufacturers take pride in saying, "My machinery does not stand on my books at a cent; all charged off." That is not a very sensible statement, as can be proved. It shows lack of knowledge as to what the valuation should be. A manufacturer should not accept the point of view of the banker, who being without expert knowledge of the value of equipment appraises it at the price of old junk. Next to the factory building, machinery is the most important asset on the books. To manufacture shoes without it is an impossibility. It should not be ignored. It should be treated honestly and scientifically.

To illustrate what the above policy of charging it all off may do to the manufacturer, there is the case of a certain manufacturer who was burned out completely. He rebuilt and re-equipped a factory and started to figure shoes on a basis of depreciating his new plant in two years. The

result was that his shoes cost so much more than formerly that he was unable to sell to his old trade. Before he was really aware of his condition, he was financially embarrassed because of his inability to get established again. The reason was solely this. He had previously had his machinery all charged off, and did not figure into his product anything for depreciation. Therefore, he gave his machinery to the people who bought shoes of him, and when he had to start over again could not sell his shoes to the same old trade because he had to get more money in order to pay for his plant. Any manufacturer who takes the above view is simply giving his plant to the purchaser of his shoes.

Many manufacturers have been to the expense of having appraisals made by outside appraisal companies in order to ascertain what their investment was worth, and thus get an inventory which would protect them in case of fire. I have seen many of these inventories a year or more after taking, which were absolutely useless because machinery had been moved to different locations, new machinery had been added and old machines disposed of, but no record made. Changes in methods and increase in production had necessitated relocating and adding to the equipment, but no record was made on the inventory of such changes, the system becoming worthless because of its inelasticity. The result was that neither ledger, blue print, nor inventory told the situation. A much better method of appraising and recording is here outlined. It is something that should be a part of every manufacturer's system and should be carried on by regular employees rather than by outside people.

We will take as an example a five-story factory. Call the bottom floor "A," the second floor "B," the third floor "C," the fourth floor "D," and the fifth floor "E." Divide each floor into convenient sections, designating each section

MACHINERY RECORD

NAME NO.

MFG. NO. USED FOR LIFE

LOCATION

BOUGHT COST INITIAL PAYMENT EQUITY

OWNER LIABILITY INSURED LIABILITY

SIZE PULLEY PULLEY COST FREIGHT DRAYAGE

SIZE BELT LENGTH FEET AT PER FOOT. COST LABOR INSTALLING

ROYALTY OR RENTAL

Repairs											
Rental or Royalty											
Repairs											
Rental or Royalty											

1014. Small, Nichols & Co., Inc., Boston. 2283-1-30

by numbering, using odd numbers on one side of the building and even on the other. Number the machines consecutively, continuing the numbers as new machines are introduced.

A drawing should be made of each floor, showing the numbered sections. Do not include the machines in the drawing as they may be moved. The sections will remain permanent.

A loose-leaf record should be made of each machine, describing it and identifying its location, together with its cost. (See Form No. 1014.)

If it should become necessary to rearrange floor A, the loose sheets are changed accordingly.

The cost of pulley, belt, labor of installing, freight, drayage, etc., should appear on this record. The record might read as follows: "Machine No. 30, Location A 15," indicating that the machine's consecutive number is 30, and its location is in section 15, floor A.

A complete record now exists, showing the amount of insurance that should be carried on each machine to cover the cost of its replacement. The cost of a machine, plus the installing charges, represents the investment in that machine which is insurable. This record should be carefully preserved and kept up-to-date as an insurance protection.

There is a space on the record for the estimated life of the machine. Perhaps it is ten years at its maximum capacity. If so, then 10% of the original cost should be depreciated each year. The only scientific basis of depreciation of machinery is upon the probable or estimated life of the machine at its *maximum capacity*. Whenever a machine has become so worn that it does not produce at its maximum capacity, it is a losing proposition.

Another sheet should be made in connection with the

machinery record, on which should be shown the original cost of the machine, its depreciation from time to time and the present worth. This sheet is made in the form of a trial balance, and the totals should exactly equal the accounting ledger record. The amount which is depreciated should be charged to the operating cost and credited to machinery depreciation.

An illustration is given below of the four values mentioned in the first part of this chapter.

The original cost of machinery installed, standing as a debit on the accounting ledger, is $100,000. At the end of five years the depreciation account may have been credited with 50%. This account would stand $50,000. The net value of the machinery is therefore $50,000, its value for a going business. Replacement value in case of fire may be $75,000 or $80,000, according to the condition of the machines. All new machines purchased should be charged to the machinery account. Nothing should be credited to it excepting in cases where machines are disposed of, in which case, the full amount should be credited and the depreciation account debited with the same. Any loss or gain that may have taken place in the disposal of the machinery should be adjusted so as to leave the depreciation account showing the exact amount of depreciation.

To arrive at the Forced Sale Value, it will be wise to create a second reserve which should be taken out of profits and surplus earnings. If desired, enough can be set aside to wipe out the machinery entirely, but there is no real good reason for doing this, as the only object should be to reduce these assets to their cash valuation, not to eliminate them entirely.

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Chapter 11

FORM BOOK

THE stationery, printed matter and office supplies should be kept in a stock room and issued on requisition, the same as other material in the factory. It may be kept in the general stock room or separately. In this connection a Form Book should be kept and a method of handling it is described herewith.

Either a loose-leaf or bound book, preferably loose-leaf, may be used. It should have a capacity sufficient to last for many years.

The front of the book should be provided with an alphabetical index. The scheme of numbering the body of the book should be by the use of keyed numbers, as 10, 20, 30, 40, etc. These numbers should be placed on every other page, the intervening pages being blank. We now have an opportunity for placing ten forms on each page. The first form in the book would be numbered 10, the second 11, and the third one 12, and so on, indicating that they were Forms No. 1, 2 and 3 respectively on page 1 or 10.

The second series of ten forms would be numbered 20, 21, 22, etc. It is well to have all forms bear their form number, and also the date upon which they were ordered, as well as the quantity ordered. This gives an opportunity to know easily how many should be ordered at one time, and how often orders should be placed. Forms should also be

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named if possible, and this name should be printed upon them. They can then be listed in the alphabetical index in the front of the book. A copy of each form should be pasted in the form book, indexed and priced. It is also well to indicate the printer from whom they were obtained.

A stock-room record should be kept of the receipt and disbursement of stationery and forms, and in this way much waste can be saved. In the average office there is a tremendous amount of waste occasioned by over-buying and careless use. There is always a tendency to over-buy printed matter, because the cost of large amounts is very much less proportionately than for small amounts. As a general rule it is not safe to buy much more than six months' supply at once, for the reason that changes are so frequently made.

Part II

Shoe Manufacturing Organization

Chapter 12

MANUFACTURING PLANTS

THE first step in building a shoe manufacturing organization is to decide upon the kind of shoes to be made, how they shall be sold, whether to the jobbing or retail trade, or both, and how large a product shall be produced. The next step is to build an organization, choose a location and acquire or build a factory. It may not be amiss in this connection to consider briefly the question of the factory itself.

In planning a shoe manufacturing business, it is well to remember that specializing is continually going on, and that the factories which enjoy the steadiest run of business and are the greatest profit producers are those of moderate size, — say from twenty-five hundred to five thousand pairs daily capacity.

In 1910 the writer made the assertion, which is to-day conceded by the best known engineers in the country to be correct, that it is a mistake to build large factories. Large plants are not easy to operate economically and invariably produce a smaller per cent of profits than several small ones. The small manufacturer who operates efficiently has nothing to fear from the large concern. The fact that some operators are building big plants should not alarm any one; there is danger that they will be too large for economy. The old idea of having a tremendous plant, employing a great many

workmen, and producing under one roof all kinds of shoes, from a man's brogan to an infant's cack, is, at the present time in this country, almost unknown.

In constructing a plant for economy of operation, a three or five-story building is usually preferable to a building having four stories. The material used in construction may depend, to some extent, upon the locality.

The fewer styles and grades produced, the easier and more economic it is to operate a plant, and concerns organized on this basis are, as a rule, the most prosperous. The location that is chosen for a plant should depend largely upon the grade of shoes to be made.

After the product has been decided upon and standardized, a decision should be made as to the necessary floor space required to produce the output estimated, and a continual fight must be made not to exceed that allowance. There are in the United States many shoe factories so poorly planned that the users might destroy them, build new, and save the entire cost of the new building in five years' time, perhaps less. The greater portion of the shoe factories in this country were not constructed by scientific men with a view of eliminating waste, and, as a result, there is waste floor space, waste power and waste time, all of which means loss of profits.

Furthermore, contending against poor construction, manufacturers cannot take advantage of all the possibilities of reducing manufacturing costs. The whole question of expense burden must be considered, if economic manufacturing is to be attained, and the costs of production are reflected in the number of square feet of floor space that it takes to produce each pair of shoes manufactured.

The writer has had manufacturers tell him that they had outgrown their present factories and must build additions.

Investigations have shown that, instead of making shoes in the number of square feet it should require for that kind of product, such wasteful conditions existed that excessive floor space was used, and the factories were producing far less than a normal volume of goods. Think of the waste going on, the possibility to decrease costs. Think of the load that productive labor had to carry because of the incompetence of management.

The most speedy production and consequent reduction of labor cost can only be secured in a properly planned factory building. The brightest manufacturers are to-day realizing more and more the difference in the number of pairs of shoes that can be produced under a certain burden of expense in a new, scientifically-constructed factory as against the old style building.

To the casual observer it might appear that a factory in one of the older centers where there is plenty of experienced help might, even in inadequate buildings, hold its own against competition in a modern factory where the help is not so capable. The expert investigator who inspects some of the old plants with several annexes and nothing constructed on a scientific basis, does not wonder that the modern plant, even handicapped by the lack of experienced labor, can more than compete with many of the older concerns. His greatest wonder is that manufacturers will undertake to make shoes in old traps of buildings where there is poor light and all kinds of waste.

As an evidence of the lack of knowledge of factory construction, even to-day manufacturers having modern plants and desiring to increase their floor space, frequently destroy their efficiency by building on additions in such a manner that they get a less usable increase than they might through some other method. The excuse generally offered is that of cheap construction.

It is very easy to save money in building and lose all that is saved in one or two years by the increased cost of feetage per pair, which means cents per pair.

Not long ago, in consulting with a concern regarding new construction, the writer had occasion to demonstrate this point thoroughly. Plans for an addition had been drawn by an architect. While versed in building city halls and hotels, this man had no comprehension of modern shoe factory requirements. The manufacturer had never heard that there was such a thing as an architect specializing in shoe factories, but he readily agreed that the specialist was the man who should be consulted.

Chapter 13

PLAN AND CHART OF ORGANIZATION

VIEWED from a broad standpoint, any manufacturing business is divided into two complete and distinct divisions: Producing and Distributing.

As time goes on and manufacturing plants increase in size and complexity, the battle of business becomes more and more difficult. To-day it is a well-established fact that the concerns having the most complete and perfect organizations are the ones which are doing the most successful business and producing the greatest profits. In a small business it may not seem necessary to have as complete an organization as in a large business, but if we carefully analyze conditions, we find that the elements of the large organization must necessarily exist in the small one. In what is sometimes called a "one-man" business we find an executive who performs the functions that in a large business are performed by a considerable number of men, but in order to produce results which are satisfactory, the one man must have, to a large extent, the qualifications, and perform the actual work, of the larger number. It is a notorious fact that many men who have shown great ability in managing small concerns have made failures in undertaking to manage large ones. Such failures have, to a great extent, been due to the fact that the men were not good organizers. In other words, either they did not realize the necessity of

gathering about themselves men qualified to perform successfully work which they had previously done themselves or else they had not the ability to successfully choose such assistants.

In considering the subject of a business organization the writer will not confine himself either to a small business where one person holds several executive positions or to a large one where each separate department has a head, but will endeavor to show the many responsibilities which exist in any business.

The first step in building a business organization is to analyze the workings of such an organization and to build a chart which will show in as elaborate form as is necessary all the varying responsibilities which must exist.

Herewith will be found a chart which shows in general the outline of a working organization which may cover a small or a large business. It will be understood that while this chart ostensibly represents the working organization of a corporation, it can, nevertheless, be applied to a co-partnership or to a concern owned by an individual. It is in some ways easier to plan an organization for a corporation than for a partnership or an individual, inasmuch as the authority and division of responsibility are defined to a large extent by the laws of the states under which corporations are formed and by their by-laws.

Whether a business concern is a corporation, a co-partnership or an individual, it is a great advantage to have a chart showing the line of authority and responsibility, as it affords a well-defined and much easier working organization. If the reader will examine the chart, on following pages, he will note that the beginning of authority and responsibility is with the stockholders, the real owners of the business. The stockholders (by law in Massachusetts and some other

states) elect, among other officers, a Board of Directors and a Treasurer. The Treasurer, being the guardian of the funds of the concern, is, or should be, directly responsible to the stockholders for their custody. The directors elect, usually from their number, a President, and if the business is of such size as to warrant it, they will elect also an Executive Committee and a Finance Committee. Each of these committees may consist of one or several persons. The Finance Committee naturally has in charge the financial operations of the concern, being empowered to borrow money, make investments and direct the general financial course of the business, although it must be remembered that the Treasurer should be responsible to the stockholders for the safe keeping of all the funds.

The Executive Committee may designate one of its number, or elect an outsider, as the General Manager of the business. It is preferable that the General Manager should cover, in that capacity, the operating end of the business, but it must not be forgotten that the supreme management rests with the Board of Directors, to whom the General Manager is responsible.

It will be noted in the given chart that the operating end of the business is divided primarily into a Manufacturing Division and a Distributing or Selling Division, and that each of these divisions is subdivided into others. In a small business one man may operate both the Manufacturing and Selling Divisions, but in a large concern this is impractical, inasmuch as one man cannot manage both ends successfully.

The writer, in his many years of experience as an efficiency engineer, has organized many businesses and made many charts, but the conditions have never been such as to warrant his making two alike.

The success of any engineer in organizing a business depends largely upon his ability to put the right men into the right places. The human element with all its limitations must be carefully considered. Few shoe manufacturers have as yet realized the importance of consulting engineers trained in the shoe business, but the time is coming when shoe manufacturing engineers will be recognized as factors in the shoe industry, as are mining, consulting, electrical and other engineers in their fields.

In the following chapters the writer will consider each sub-division of the business as a unit by itself, but the reader is cautioned to remember that while all the subdivisions are thus treated, they must nevertheless work in conjunction with one another, and that the responsibility of each is finally traced back to the Board of Directors and to the Stockholders.

The reader will notice by consulting the chart that no special provision has been made for an office department, but that the office work will be distributed more or less through all of the departments. The greatest amount of office work will be done in the departments of the Treasurer and Sales Manager and in portions of the Manufacturing Division. The office work may be arranged in such manner as will best produce the results desired, but the detail is not taken up in this book as the writer is discussing the general problem of manufacturing.

In considering the various departments into which a business is resolved, the financial end of the business will be considered last, although it is, of course, of primary importance. The other portions of the business will be considered, as nearly as possible, in their logical order.

The first step in the actual production of shoes is, of course, to design them and to create sample lines. There-

fore, the department of the style manager will be considered first, and in rotation — the sales department, supplies department, production department with its sub-divisions of maintenance, labor, planning, quality and factories; paymaster's department and cost department. By treating the subjects in this manner, we trace the product from its inception through its sale, the obtaining of materials for its construction, the provision of labor and mechanical equipment, through the planning of the factory operation, the maintenance of quality and actual construction, the payment for the labor, the records of cost, and finally, considering the financial division, through the receipts and profits of the business.

It will be noted in the chart that all of the manufacturing and selling is done under the direction of the General Manager. In many cases the sales department might be conducted under the direction of a Sales Manager responsible directly to the executive committee or to the directors, but for simplicity's sake, in this instance, it is considered as being under the direction of the General Manager and the entire manufacturing and selling is considered as the operating division.

In the operating division, as considered above, the departments of sales and production are of the most importance. The production department is of extreme importance inasmuch as it must *produce* all profits. To verify this statement it is necessary to consider what profits actually are. A true profit is increased wealth and increases in wealth can only be made by combining labor and raw material. Some men will contend that profits are produced by the sales department. This is not strictly true. The sales department merely realizes for the company the values which have been created by the production depart-

ment. In other words, profits and losses are the difference between what anything costs, either to buy or to produce, and what it is sold for, and profits do not *actually* exist until an article has been paid for. If, for example, there were two concerns manufacturing shoes of identical kinds, grades and qualities, shoes as near alike in appearance and value as "peas in a pod," with one concern selling them at a higher price than the other, it would simply mean that the selling department of one concern was able to realize to a greater extent than the selling department of the other, the values which were produced in manufacturing. Hence, we see that it is not only of extreme importance to manufacture goods economically, but it is of equal importance to so dispose of them that the values produced are returned in dollars and cents. The expense of operating a sales department is a burden which the producers must collectively bear to obtain a market for the result of their labor.

It will be seen that while it is the work of the selling department to realize upon the values produced, nevertheless the workers in the factory are the direct means of *producing* profits. Here we have the first great division between labor which is Productive, and labor which is Non-Productive.

In considering the distribution of the product, we find that between the time it leaves the producers until it reaches the ultimate consumer it passes through a greater or lesser number of organizations. In the case of the manufacturer disposing of his product through his own retail stores, it passes primarily through only one selling organization, that of the retail store, although in some cases the manufacturer may operate one or more jobbing houses of his own which are in reality selling organizations. In the case of the manufacturer selling to the retail trade, the goods must pass

through at least two selling organizations; that of the manufacturer and that of the retailer, and here again the manufacturer may operate a selling organization in the shape of a jobbing house. In the case of the manufacturer selling to the jobbing trade, the goods pass through at least three selling organizations; that of the manufacturer, that of the jobber and that of the retailer.

Thus we see that the value created by the workers of the factory is not entirely realized until the product has reached the consumer. The manufacturer may get for himself the entire profit or the profit may be divided amongst a number of selling organizations before it is entirely realized, each selling organization assuming its share of the responsibility and expense of distribution.

Chapter 14

FUNCTIONS OF DEPARTMENTS

Style Department

WHETHER a business is what may be termed a "one-man" business in which the owner may act as his own Style Manager, or whether the business is large enough to make a special department for the origin of the product, some means must be provided for the inception of such product as can be made and sold profitably.

In the factory producing a great number of shoes, the question of style or design is one of extreme importance, inasmuch as the operation of the factory depends to a large extent upon the kinds of shoes produced.

The origin of styles is the first step in manufacturing, and the Style Manager must necessarily be a man familiar with both the selling and production departments. It is his work to design lines of samples, originate new styles, select new patterns, lasts, etc., specify the construction of shoes and the materials to be used in them, and approve the general method of construction. He should also fix the selling prices.

It may appear to some people that the Sales Manager should establish the selling price of goods, but if consideration of this matter is carried to the final analysis, the writer believes it will be plain to any one that such is hardly the

case. It is primarily the province of the selling department to market the goods as it is the primary province of the producing division to manufacture them. It is the province of the style department to design such a product as may be produced economically, and for which a satisfactory market may be found. That this is so, is exemplified by the fact that many manufacturing concerns having a well-organized selling department nevertheless require that all new styles be approved and all selling prices confirmed by a person acting in the capacity of General Manager, who, while not holding the title of Style Manager, nevertheless acts in that capacity, although he may delegate to others the actual origin of styles and lines of samples.

Sales Department

Inasmuch as this book is written primarily for the purpose of discussing Production and Production Costs, the question of sales will be considered to only a limited extent.

When the product has been properly designed, it is the work of the sales department to dispose of it. This department is in charge of a person usually designated as a Sales Manager. It is his duty to employ and direct salesmen, assigning territories.

If an advertising department is maintained, it, under an Advertising Manager, should become a part of the sales department. An order department under a Chief Order Clerk would also be included in this department, in which should be conducted the handling of all orders, statistics of sales and salesmen and correspondence with salesmen and customers prior to the delivery of the orders to the production department. The sales department should also include the shipping department and the department for stock shoes,

if one is maintained. The department of credits should preferably be under the direction of the financial division.

Store Department

The next logical step after orders have been received and accepted is to provide materials out of which the shoes are to be constructed.

While for years in the shoe manufacturing business it was not customary to maintain a store department which provided all materials and supplies, the heads of various departments purchasing, to a large extent, their own materials, to-day there is a growing tendency to concentrate the purchases under the direction of a Purchasing Agent.

Shoe manufacturing has become so complex, and the task of handling labor so great, that the heads of operating departments should not be taxed with any work other than the direction of their own departments. Buying is a work in itself which requires certain qualifications, and these qualifications are not usually found in those who are good factory men.

Broadly considered, the Purchasing Agent should provide all materials and equipment required for the operation of the business. He should have control of all receiving departments and act as the custodian of all store rooms, supplies and equipment until requisitioned by the production department.

It may be that the Purchasing Agent will require the assistance of others who are specialists in the buying of certain articles, and he must necessarily keep in close touch with the production department in order to purchase intelligently and provide materials which will insure an economic and satisfactory product.

When materials have been provided they should be kept

in suitable store rooms and be issued only upon written requisitions. Requisitions may be in the form of tags or special orders for certain articles. Records of disbursements should be kept in such a manner that cost figures are readily obtained. Figures may be required which show the cost of conducting departments as a whole, or sub-divisions of departments, and in some cases, of individual machines, depending upon conditions.

Perpetual inventories should be carried, showing at all times the amount of supplies on hand. Records may well be kept, specifying the amount of each class of material ordinarily kept on hand, and in order that the buying may be intelligently done, the purchasing agent should be supplied by the production department with data as to its future wants.

It will be the tendency in the future for manufacturing concerns to produce many articles which they at present purchase from others. All such articles should be carried by the store department or the records of their consumption be handled by the store department.

It may seem to many that the maintenance of a store department is an unnecessary expense, but experience has proved that it is not an expense in the sense of an unprofitable burden, but that it is a means of saving.

Many factories are cluttered from attic to cellar with supplies of various kinds, and tremendous waste necessarily occurs. The elimination of this waste will mean that much less burden for Productive Labor to bear.

Production Department

We have now traced the shoe through its inception, sale, receipt of orders, the purchase of materials and supplies, and have arrived at the point where the shoe is about to be made.

The actual manufacturing is handled by the Production Department, which contains several sub-divisions. These sub-divisions in logical order are — maintenance, labor, planning, quality and factory.

Maintenance

In order to operate the factory, it is necessary that buildings be kept in condition, that power, light and heat be furnished, and that machinery and equipment be kept in operating condition.

The duty of caring for these items is the function of the maintenance department. It is much better, especially in the case of a large concern, that a special department be organized for this purpose, inasmuch as there are many items to be carefully looked after. The buildings themselves must be kept in repair, floors kept in condition, etc. If power in the shape of electric current is purchased, the problem of its distribution and utilization is reduced to a minimum. If a power plant is operated, this item is of great importance, as frequent shutdowns mean loss of production. The plant must be adequately lighted, else production falls off. The factory should be kept at the proper working temperature, neither too hot nor too cold. The question of caring for machinery has been much discussed. Some superintendents believe that the care of machinery should be left to the foreman of each department, maintaining that the machinery will be better cared for. This can hardly be so. If one will study carefully the condition in a factory where machinery is cared for under the direction of individual foremen, and especially where operators are permitted to repair and adjust machines, he will find that the mechanical equipment as a whole in ninety-nine cases out of one hundred is below par. In other words, the operator

will not spend the time to see that his machine is kept clean, that all screws and bolts are tight, and that the machine is properly adjusted. If the machinery is not in such condition that it can be run at its maximum speed and do perfect work, lessened and imperfect production is sure to result. Again, if machinery is not kept in the best possible condition, it is continually getting out of repair or adjustment, which means further loss of production.

In Chapter 13 the statement is made that all profits arise from Production. Hence, it is easy to understand how essential it is that the volume of production be kept at a maximum. Whatever is true of keeping machinery in first-class running order is equally true of all other forms of equipment, whether fixed or movable, and the writer cannot impress too forcefully upon the reader the vital necessity of keeping the volume of production at its maximum if the full return in profits is to be expected.

Labor Department

Shoes cannot be manufactured without labor. Inasmuch as profits are made by combining raw material and labor, it is essential that the labor employed be of the highest obtainable class.

Many arguments have been advanced to show that better results are obtained when each foreman hires his own help. In spite of these arguments, actual practice has shown that such is not the case. The proper selection of labor requires certain qualifications which are generally lacking in men who otherwise make first-class heads of departments. Broadly speaking, the labor in a factory is purchased just the same as material and equipment is purchased. It should not be necessary for a foreman to spend his valuable time in hiring men. He should be held responsible for the conduct

of his department so far as the product is concerned, but he should be provided with every facility, so that his entire time and attention can be devoted to the manufacture of shoes. The price that is paid for labor is, in altogether too many instances, the result of bargaining between the foreman and the workmen and is seldom in the shoe business based upon the actual value of the work performed. The only just and accurate way to ascertain the value of certain operations is by means of carefully made time studies. The average operator does not perform his work with the minimum expenditure of time and exertion. There is one best method of performing an operation, and it should be the work of the labor department to determine the best method of performing operations and the amount of time required for so doing. In this manner all the different operations necessary to the construction of a shoe can be put upon an equality basis. A workman should have the same earning capacity operating on a difficult shoe that he has when working upon an easy shoe. When prices are not so fixed, we find a condition where an operator can earn at a much higher rate when working on some shoes than on others. The result is invariably dissatisfaction and the demand for increased prices on certain shoes. The writer is not endeavoring to defend either a high or low rate of wages, but believes that both the employer and employee are entitled to fair treatment.

With a labor department operated properly, factory conditions are bound to be better and more harmonious. There is less liability of unfair treatment upon the part of foremen, and in case there is surplus help in one department, it can frequently be transferred to another department which may be short of help.

The labor department in addition to employing and dis-

charging men, making time studies and determining prices, should keep such records of employees as will show who are the most valuable and who should be discharged first in case discharges become necessary. Favoritism on the part of foremen should be strictly prohibited, and all employees should be treated exactly alike.

The labor department should have control of factory entrances, watchmen, etc., and should have all dealings with labor unions.

Planning Department

Of all the divisions of the Production Department, that devoted to planning is of the greatest importance, for upon it depends the smooth, steady and economic operation of the factory.

The planning department as considered in this book is that portion of the organization which takes the materials furnished by the store department and manufactures shoes to fill the orders taken by the sales department. It must first of all, upon the receipt of orders from the sales department, make whatever analysis of them is required, assign delivery dates and furnish the purchasing agent with data covering requirements. It should then write the factory tags and select the work to be put into the factory each day. It should make the factory sheets, direct the operation of the sheet system in the factory, follow the progress of shoes through the works and make reports of production. It also devolves upon this department to devise methods of operating, initiating easier and quicker and more economic ways of making shoes. It might in short be called a "ways and means" department. If the entire control of labor is vested in the labor department as outlined in this book, then the planning department should call upon the labor department

to make whatever time studies are necessary in determining upon the merits of changes in method. In some organizations it would be better to have the time studies made by the planning department, rather than by the labor department.

The most important work which this department has to perform is that of operating the production system, which is sometimes called the "sheet" system. The importance of the production system is so great that the writer has devoted a special chapter to its consideration. (See Chapter 15.)

Quality Department

The quality department is second in importance only to the planning department. Many would consider it of greater importance than the planning department. However, if the planning department is not properly conducted, the quality department will find it impossible to get the results expected of it, and in any event, quality depends to a large extent upon the precision with which predetermined methods of manufacturing are carried out.

In times past quality of shoe making depended upon the skill of individual employees, but modern factory methods have necessitated a departure from a dependence solely upon the ability of individual workmen and require that shoes be manufactured in accordance with well-defined plans.

The quality department should have charge of all inspection work, and it is its special duty to see that the quality of product is maintained.

It is needless to say that the planning and quality departments must be in close touch with and work in conjunction with each other, as together they direct the operation of the factory.

Factory Department

The factory or factories, if there be more than one, should be operated under the supervision of local factory managers, who should have, under the direction of the production and quality managers, charge of actual factory operations. Under them also will come the foremen or heads of departments and through them will follow the control of labor.

Upon the successful operation of the factories depend both the quality and quantity of output, and upon these two features depends the profit of the business.

It may seem that in the outline of the organization which has preceded the greater part of the work usually performed by the factory manager has been taken away from him, and it is true. In a factory of any size any superintendent will find his efforts taxed to the utmost if he is to properly operate his plant. If he is to further have his energy taxed with the designing of shoes, the purchase of materials and equipment, the upkeep of the factory building and equipment, the hiring of help, and the planning of factory operation, some portion of the work under his supervision is bound to suffer. In the organization as outlined, an attempt has been made to arrange everything for his convenience and make it as easy as possible for him to fulfill the exacting duties which will be required of him.

If the factory sanitary and elevator services are not cared for by the maintenance department, they will fall under the care of the local factory manager.

PAYMASTER'S DEPARTMENT

The Paymaster's Department deals with the remuneration of the factory workers. It may or may not care for the labor of the clerical forces. It should control time clocks

and labor checking, compile the payroll, obtain the money for the payroll from the cashier, place it in the pay envelopes and distribute the pay envelopes among the employees. In some factory organizations the paymaster is not under the jurisdiction of the operating division, but the writer believes that preferably he should be under such jurisdiction.

Cost Department

It is the province of the Cost Department to oversee all cost work, to make all estimates of cost and consequently all allowances. It should also compile statistics of the consumption of materials, the cost of labor and all expenses, and make condensed cost or operating statements.

It cannot be stated too often that shoe manufacturing as conducted to-day is in reality a contracting business, the factory agreeing to furnish the selling division with shoes at certain prices and following certain specifications. Consequently, it is necessary to employ an accurate basis for estimating the cost of shoes which are to be produced. A great many methods are employed in estimating the cost of shoes, and there are few manufacturers who know the exact cost of each style or kind of shoe which they manufacture and the greater the variety of construction, styles, grades, etc., the less accurate their figures are apt to be.

There is a large class of manufacturers who always endeavor to "figure safe," and there is also a large class of manufacturers who, because of conditions in their selling department, figure extremely low. The result has been bad for both classes in many cases. The first class has often figured itself out of business, being apparently unable to meet competition, and the second class has, in many cases, become insolvent, being unable to produce shoes at the estimated cost.

The greatest deficiency usually found in the work of estimating shoe costs is entire lack of knowledge of how to figure correctly the burden of expense. It is comparatively easy to figure material cost and labor cost.

There are, among many others, two common methods of estimating the cost of overhead expense as applied to various shoes. One is by using a per cent of the selling price and the other is to use an estimate of so much per pair. Neither of these methods is correct. Using the first method and taking as an example a shoe selling at $4.00 per pair, with an expense estimated at 10% of the selling price, in case the material cost of this shoe was increased so that it would have to be sold at $4.25, the expense burden would be theoretically increased two and one-half cents per pair. It is easy to see that the expense burden would not have increased any such amount. The writer has seen many instances where this method was used where cost estimates were erroneous to the extent of 10 or 15 cents per pair. If the method of using a flat rate per pair were employed, and a kind of shoe were introduced which necessitated an increased labor cost and a much slower process of manufacturing, the burden of expense allowed would be entirely wrong. Many manufacturers changing from one kind of shoes to another have seriously impaired their profits by figuring expense by this method.

It is therefore necessary to find a base which is more reliable and the base which is generally accepted to-day is productive labor cost. If shoes are more or less difficult to manufacture, if they require a longer period of time in the processing, or if they require more or less machinery and equipment, these facts are reflected in an increased or decreased cost of productive labor. On the assumption that labor is paid on an exact basis of the value of the work

which is performed, labor cost would be a very accurate basis upon which to pro-rate expenses. It is true in the shoe manufacturing industry that labor is not always paid on the basis of what it performs, but there is no basis of pro-rating expense that is more accurate. In other words, for every dollar expended in labor, there is a certain amount of money expended for expenses.

The detail of figuring the cost of material and labor is not at all difficult to carry out. The manner in which this detail should be carried out depends very largely upon the conditions which exist in any given plant. The method to be used in estimating the cost of shoes is very fully gone into in the first chapters of this book, where the reader will find very simple and easily operated methods, and, moreover, methods which are practical and which yield good results.

It is needless to say that any person installing a cost system in a shoe factory must, if adequate results are hoped for, be a person who is familiar with the shoe manufacturing business. A great many systems have been installed which have proved unsatisfactory, due largely to the fact that the person making the installation was not familiar with the problems that existed in the manufacture of shoes. The theory of cost accounting is, of course, the same in all industries. It is the specific details existing in the individual industry which require a man of experience in that particular industry.

It is safe to say that no other manufacturing industry presents so many complications as that of shoe manufacturing, and this fact is largely responsible for the non-success of many shoe factory cost systems. It is true that many shoe manufacturers have been very successful, even though they had practically no cost systems at all, relying

upon the ability of the selling end of the business to get high prices for their product. The time is coming, however, when this is going to be more and more difficult, and many of the larger concerns have begun to realize that they must be closer in touch with the actual cost of producing in order to maintain their position in the manufacturing field. A man who is capable of installing an accurate cost system is a man of great value, and as stated before, he should be a man who is intimately acquainted with the problem of manufacturing shoes.

In addition to the work of making estimates of cost, it should devolve upon the cost department to compile statistics showing the consumption of material, and the cost of labor and overhead expense. It should also furnish reports of production, and by combining these four, furnish a condensed cost or operating statement, as shown in Chapter 7.

It is not to be assumed that a manufacturing concern will make profits simply because it operates an adequate cost department, but that the cost department will furnish statistics showing whether or not the business is being conducted at a profit, so that a policy may be adopted which will insure the greatest amount of profit possible.

Treasurer

In Massachusetts and some other states laws provide that the treasurer of a corporation shall be elected by the stockholders, and the by-laws of any corporation may make such provision if desired.

One of the evils of the present-day corporation practice is that many treasurers are elected by directors, the result invariably being that the presidents of concerns have absolute control not only of the operating end of the businesses, but also of the finances. That this is not a policy which

makes for the greatest protection of the stockholders is evidenced by many recent happenings.

The treasurer of a corporation having in his charge all the funds of the corporation, should not be subservient to any man or group of men other than the stockholders who own the corporation. He should be entirely free from any pressure which may be brought upon him through officers of the corporation who may have schemes for their own aggrandizement at the expense of stockholders.

The treasurer should sign all notes and contracts, except those of the purchasing agent. He should sign all checks after approval by the comptroller, control the accounting and have control of credits and collections. Under him should be a cashier, a bookkeeper and a credit manager. The cashier should have control of all cash, see that discounts are taken, write all checks, and make a daily financial statement for the treasurer. The bookkeeper should have charge of all books of account and compile periodic statements of assets and liabilities. Upon the credit manager devolves the work of getting information regarding customers, the granting of all credits and the making of all collections. With an outline such as this, the treasurer is in complete charge of all the funds of which the corporation is possessed.

Comptroller

Like the treasurer the comptroller should be responsible solely to the stockholders, and should be elected by them.

It is the prime duty of the comptroller to see that the funds of a concern are not misspent. He should plan the accounting and other office systems, approve all payments before checks are signed by the treasurer, and furnish to the stockholders and directors periodic reports of the condition of the concern and of the business in general.

Chapter 15

PRODUCTION SYSTEM

(Sometimes called "Sheet System")

THE advantages of operating a shoe factory under a well-planned Production System are so great that it is a matter of wonderment that more factories are not so conducted.

Aside from the economic use of material, there is no profit producer its equal. The chief advantages lie in the uniform volume of production and the resulting effect in the reduction of the cost of overhead expense, in the increased earnings of labor, and in the more perfect performance of labor operations. Neglecting such advantages as the ability to foretell exact dates of shipment and the ability to complete orders in accordance with agreed terms of sale, the previously cited advantages more than compensate for any expenditure of time or money necessary for its successful operation.

Some people look upon the Production System merely as a means of enabling them to predict shipping dates and to insure the shipment of goods when promised. These are indeed valuable features, but when the Production System is looked upon from a broad standpoint, it should be considered rather as a valuable assistant in the making of profits than as anything else.

In order to receive the greatest value from a Production

System, the plan must be arranged in such manner that the highest efficiency will exist. It requires first of all that equipment be properly located to insure rapid and smooth passage of goods in process. Unless equipment is so located, more or less trouble will be encountered.

In order to use the equipment to the best advantage, orders must be analyzed when received. This analysis must be made in such a way as to show the burden about to be placed upon each kind of equipment during the days and weeks which follow, and show as well the necessity, if one exists, of acquiring additional equipment.

If no office records of orders ahead of the works are kept, it will be impossible to intelligently promise goods and lay out work for the factory in such a manner as to insure either the fulfillment of promises or the smooth operation of the plant.

If a Production System is operated in such manner as to obtain high efficiency, it will be found of great advantage in keeping the amounts of raw material on hand and shoes in process at a minimum. In a factory properly operated, it is no unusual thing to find from one-third to one-half less investment in materials and goods in process than in the factory not so operated. The saving in interest charges by reducing the amount of active capital employed will more than pay for the cost of operation, or with the same investment of capital, many more shoes and greater earnings will result.

The effect upon labor is beneficial, inasmuch as workmen are insured a full day's work each day, which in turn means a full pay envelope at the end of each week. The workman is operating under better conditions. The work comes to him in better shape and he can do it faster and more perfectly. Some may question the truth of this assertion, but it is nevertheless a proven fact that such is the case.

The effect upon the trade is so well known that it needs little consideration. Jobbers and retailers always give a preference to producers who can deliver goods when they are wanted, or at least when they are promised. As a selling feature, a well-organized Production System is a tremendous factor.

If the advantages of a well-planned and operated Production System were sufficiently understood by manufacturers in general, the present day would see no shoe factory conducted without one.

The general plan of operation of a Production System is always the same. The actual detail varies considerably with individual conditions.

The factory making shoes for the jobbing trade is a somewhat easier proposition to operate than a factory making shoes for the retail trade. The lots of shoes usually contain a larger number of pairs and are more uniform in size. Delivery dates also offer less complications.

In general, a Production System consists of putting into the works each day approximately a given number of pairs of shoes so selected that they will pass through the works without meeting unusual obstacles and delays. Serious complications sometimes arise which would seemingly prevent the carrying out of this idea. Ordinarily work is sent to the cutting room once a day, or as commonly expressed, one sheet a day is entered. This method is usually quite satisfactory, except when there are Saturday half holidays. When such exist, and six equal sheets are entered each week, then it becomes necessary for factory departments to gain one hour each day for the first five days of the week in order that the sixth sheet may be completed by Saturday noon. Either this is necessary or a half sheet must be entered for Saturday. The objection to this method is that this half sheet may leave one department on Saturday

with perfect satisfaction, but it passes through other departments on other days of the week, and frequently causes more or less trouble.

The best plan of operation is to use two sheets each day, or twelve sheets per week, using eleven sheets per week if Saturday half holidays exist. It is a little more work to make two sheets per day instead of one, but there are some advantages which will offset this extra labor. One of the chief advantages is the ability to pass shoes through the works in a shorter average time.

In laying out the detailed estimates in Chapter 5, the two sheet a day method is used.

It is impossible to describe a Production System which will seemingly fit all cases, and the following outline must not be considered other than in the line of a general plan.

The equipment of forms and appliances necessary varies in individual instances, but in general is about as follows:

Reports and Forms

1. Analysis of Orders Received.
2. Analysis of Shoes Put into Works.
3. Weekly Balance of Goods Ahead of the Works. Obtained from 1 and 2.
4. Last Ledger.
5. Production or Day Sheets.
6. Calendar and Time-Table.
7. Tracers.

Appliances

Typewriter.
Duplicating Device.
Files to hold Sheets at Checking Stations.
Time Stamps at Checking Stations.
Tag Files in Office.

The following are brief descriptions of the use of the foregoing forms. Copies of forms themselves are not given, with the exception of the Last Ledger, as such forms must be adapted to individual conditions.

Analysis of Orders Received

The purpose of this record is to show as completely as is necessary the burdens which are about to be placed upon the factory and its equipment, such for instance as the quantities of different kinds of shoes to be made, as Buttons, Oxfords, etc.; the number of pairs to be made on each style of last, and the quantities of tan and patent leather shoes, etc.

This Analysis of Orders should be kept by shipping periods. By this is meant, the dividing of each month into two, three or four parts or periods, as seems advisable, and assigning all goods to a certain period, rather than to an individual day in that period.

This presents a much simpler proposition than an attempt to operate by specific dates, although after a factory has been organized and operated upon a satisfactory production basis for some considerable length of time, actual dates may be used with complete success. For a beginning, the division of each month into two periods, from first to fifteenth, inclusive, and from sixteenth to thirty-first, inclusive, will be found to be quite satisfactory.

The Analysis of Orders Received can best be kept in a loose-leaf form, one page being assigned to each delivery period. The ruling of this form depends upon the number of features of which it is necessary to keep track.

Analysis of Shoes Put into Works

This report so far as the form is concerned is identical with the Analysis of Orders Received, and on it are entered,

in the same detail, the goods as they are sent into the works.

Weekly Balance of Goods Ahead of the Works

This balance is obtained from the two foregoing analytical reports, and the form used is exactly the same.

This report is the difference between the Orders Received and the Goods Placed in the Works, and shows in detail what is ahead of the factory. It is the basis upon which deliveries may be definitely promised, and is the means of utilizing factory equipment to the greatest capacity and advantage. It also is the source of knowledge of new equipment requirements.

It is a self-evident fact that it is impossible to intelligently promise deliveries unless knowledge of factory producing capacity is at hand. It is impossible to purchase materials intelligently unless requirements are known, and it is impossible to purchase equipment intelligently unless producing capacity and requirements are known.

Almost every manufacturer of shoes has had more or less experience in attempting to perform the impossible; in attempting to get more shoes through the factory than the equipment could care for; in attempting to pass shoes rapidly through the congested plant, and in attempting to force the production of goods for which some of the necessary materials were lacking.

A careful study and the intelligent use of the information disclosed in a Report of Shoes Ahead of the Works will almost completely overcome the most serious difficulties of factory operation.

The Last Ledger

The Last Ledger is a record showing the use of lasts and

15 LAST E WIDE LAST RECORD

(Form W.) 2328-1-30 Small, Nichols & Co., Inc., Boston

SHEET IN OUT	1	-	2	-	3	-	4	-	5	-	6	-	7	-	8	-	9	-	10	PAIRS IN	OUT	BAL.
*Inventory			50	40	60	50	80	75	100	85	90	70	80	60	70	50	60					1020
1					5	3	9	5	15	6	12	7	10	6	8					86		
Balance			50	40	55	47	71	70	85	79	78	63	70	54	62	50	60					
3					10	8	15	12	25	18	20	15	16	11	12	5	9			176		
Balance			50	40	45	39	56	58	60	61	58	48	54	43	50	45	51					
4			5	5	12	9	15	12	20	16	18	17	16	12	12	5	5			179		
Balance			45	35	33	30	41	46	40	45	40	31	38	31	38	40	46					
6			2	2	5	4	10	5	10	5	9	7	8	4	5	2	5			83		
Balance			43	33	28	26	31	41	30	40	31	24	30	27	33	38	41					
8			3	2	4	3	8	7	12	16	9	9	8	7	8	5	9			110		
Balance			40	31	24	23	23	34	18	24	22	15	22	20	25	33	32					
9			2	2	3	3	4	3	7	6	7	6	3	4	2	2	2			56		
Balance			38	29	21	20	19	31	11	18	15	9	19	16	23	31	30					
10			4	4	7	5	12	10	11	10	12	9	10	8	8	4	4			118		
Balance			34	25	14	15	7	21	0	8	3	0	9	8	15	27	26			808		212
*1					5	3	9	5	15	6	12	7	10	6	8						86	
Balance			34	25	19	18	16	26	15	14	15	7	19	14	23	27	26			808	86	298
12					5	4	7	5	12	9	12	7	8	6	5	2	4			86		
Balance			34	25	14	14	9	21	3	5	3	0	11	8	18	25	22					
*3					10	8	15	12	25	18	20	15	16	11	12	5	9				176	
Balance			34	25	24	22	24	33	28	23	23	15	27	19	30	30	31			894	262	388
15										Et	c.											

*These figures should always be entered in red.

the quantities available for use. It is preferably a loose-leaf affair, a separate page being used for each width of each last.

A sample of this form, which is almost universal in its application, is illustrated herewith (Form W).

It is obvious that this ledger to be of value must be opened by the entry of a complete and accurate inventory of lasts, taken by styles, sizes and widths.

This inventory should be entered on the Last Ledger on the first line marked "Inventory," and the total of all pairs on this line extended in the last column marked "Balance." This entry should be made in red ink.

The following description of operating a Last Ledger is the method used for Welt and Turned shoes. McKays are taken care of in a simpler manner.

When tags are selected for the compiling of a Production Sheet, the number of pairs of each size and width of last required must be entered on the proper page of the Last Ledger, care being taken to see that the sizes are placed in the proper columns. Entry must also be made in the column marked "Sheet In" of the sheet number on which these lasts apply, and in the column "Pairs In," the total number of pairs of the given last and width.

The next step is to obtain the balance of unused lasts by subtracting the pairs used from the inventory, size for size. The succeeding sheets are handled in a similar manner, except that the balance is obtained by subtracting from the previous balance instead of from the inventory. Care must be taken that no more shoes are placed in the works than there are lasts available.

After a certain number of sheets have been entered, it will be evident that there will be insufficient lasts remaining, making it impossible to enter more shoes. This situation is

remedied by adding to the last remaining balance on the Last Ledger such lasts as have completed their service in shoes and are again available.

To ascertain which lot of lasts are available at any time, it is necessary to consult the Factory Time Schedule and ascertain how many days lasts actually remain in shoes. If, for instance, the lasts remain in shoes five days, or a period covered by ten sheets, it is evident that the lasts used on Sheet No. 1 again become available for Sheet No. 11. However, it takes some time to remove lasts from shoes and to select them for their re-use; therefore, it is preferable, everything considered, to allow at least a period including one extra sheet, which in the given instance would render them available for the twelfth sheet. It is possible, therefore, to ascertain the lasts available by subtracting the number "12" from the sheet number about to be entered, and all lasts on the sheet number remaining, or on sheets bearing lower numbers, if not previously used, are available.

It is preferable before each sheet is entered to bring down and add to the final balance all lasts which may be available. In doing this, enter in the column marked "Sheet Out" the sheet number which is brought down; in the various size columns, the number of pairs of each size brought down, and in the column marked "Pairs Out" the total number of pairs. Adding these pairs of lasts, size for size, to the previous balance, will give a new balance of the lasts available for the next sheet. The work is thus performed as succeeding sheets are entered.

The work of keeping a Last Ledger, while not difficult, requires a great deal of care, for if mistakes are made, either there will be insufficient lasts when shoes reach the lasting department, or else records will show that there are not

sufficient lasts, when in reality there is an abundance; therefore it is necessary to prove the accuracy of the work performed. It is for this purpose that the two columns marked "Pairs In" and "Pairs Out" are provided.

To prove the accuracy of the work, find the total of each of these columns. Also find the total of the final balance, entering this total in the column marked "Balance." If the work has been accurately performed, the total of column marked "Pairs In" less the total of column marked "Pairs Out," plus the total of the final balance will equal the original inventory.

If the work has been incorrectly performed, the proof will show it, except that pairs of sizes may be inadvertently shifted from one column to another, either by accident or when shoes are made up or down a half size or size.

To ascertain whether mistakes of this kind have been made, add to the pairs, size for size, in the final balance, all sheets which have not become available, and the total will equal the number of pairs for the corresponding sizes in the original inventory.

The proof of the total number of pairs of lasts should be made each day, then an error is quickly detected and easily corrected.

The proof of the total number of pairs of each individual size should be made, if possible, at least once a week.

Various forms for keeping last records have been devised by different people from time to time, some of which are simpler than the method described above. Everything considered, the method described offers advantages found in no other scheme, as it presents a complete record of the manipulation of every size and width of every style of last, and if errors have been made, they may be easily rectified. Also, if it is desired to send shoes through the factory on special

schedule, as is sometimes the case, this form of Last Ledger gives absolute knowledge of just what can be done in that direction.

It will be understood that all purchases of lasts must be entered on the Last Ledger and all lasts destroyed, broken or otherwise disposed of, must be deducted from it.

Many factories have attempted to operate a sheet system without the aid of an adequate Last Ledger, but no factory has ever yet succeeded in so operating a factory with a minimum of expenditure of last equipment. The saving of the clerical cost of keeping a Last Ledger is mighty expensive economy.

Production Sheets

(Sometimes called Day or Work Sheets)

These are sheets of paper on which is printed certain information taken from the tags. This information usually consists of the case or tag number, number of pairs, style of shoes, etc., the amount of information depending on the needs of the various departments through which the shoes are to pass.

After tags have been selected for a sheet, and have been entered on the Last Ledger, they should be arranged in some pre-determined manner with the proper case numbers in rotation.

The sheet itself is then written, preferably on a typewriter with a duplicating ribbon. From this original copy the required number of copies may be reproduced on a duplicating appliance. There must be at least one copy for each checking station, plus whatever copies are needed for office records.

The copies which are to be placed at checking stations should each be marked with the name and number of the

checking station to which it is assigned, and the day and hour upon which it is to be completed at that station, the date being found by reference to the Factory Calendar.

These Production Sheets serve three purposes: First, to give the heads of departments information as to the quantities and kinds of shoes to expect; second, when to expect them; third, a means of knowing when shoes have passed the various stations.

Calendar and Time-Table

A Calendar, as the name implies, is a time record and may be called a dispatching sheet, as on it is noted the time schedule of each sheet, showing the day and hour set for completion at each checking station, and also the day and hour of actual completion.

A Calendar may be made in numerous ways by ruling a sheet of paper with vertical and horizontal columns, placing the days of the month in one margin and the checking stations in the other. The preferable way is perhaps to have the days of the month on the left-hand vertical margin, with as many vertical columns as there are checking stations. By tabulation opposite the dates and under the checking stations are noted the sheet numbers due to pass the various stations on the dates indicated. The time the tags are scheduled to leave the office should be placed on the Calendar as one of the checking stations, it being as essential to keep tabs on the office as on any other department.

It is, of course, necessary to arrange a Factory Time-table before the Calendar can be filled in. By "Time-table" is meant the number of days or hours required to pass shoes through each department.

In arranging a Time-table, care must be taken to allow

sufficient time for the completion at each station of the last case of shoes on each sheet.

There are in use several methods of passing shoes by checking stations, but in any event, it is customary in well-regulated factories not to permit a workman to operate on a case of shoes if any cases on preceding sheets are incompleted at his operating point. Some factories prefer to pass all the shoes on one sheet at one time. This is not perfection in operating a production system as it does not permit an absolutely steady and uniform volume of shoes to be moving at all times. A much better way, after some perfection has been attained, is to require the movement of a certain number of pairs each hour. That is, have production arranged on an hourly basis. This offers a means of obtaining maximum efficiency which it is difficult to obtain in any other manner.

It must be remembered in making Factory Time-tables that the best possible results can hardly be attained at the start, but the entire factory organization, both supervisory and operating, must be accustomed to the production system in order to appreciate all its good features and take advantage of them.

In some factories only one Time-table is necessary. This may consume a total time of from fourteen to twenty-two or three working days, the former being shorter than ordinarily found, and the latter being somewhat longer than is necessary under any ordinary conditions. Nevertheless, it is possible when perfection is approached to make shoes and make them correctly in a remarkably short period of time. Of course, in order to do this, factory conditions have got to be very nearly right.

In some factories it is advisable to maintain more than one time schedule. In other words, a regular running time

of perhaps eighteen days may be used with a special ten or twelve-day schedule, when making such special hurry lots as the policy of the factory may require.

Still another schedule may be used for making special pairs.

It is usually found that concerns making shoes for the retail trade require more elaborate time schedules than those making shoes for the jobbing trade.

The laying out of the Factory Time-table is a matter of great importance, and one that requires a complete knowledge of shoe manufacturing and considerable experience in operating production systems.

If the required means are taken, it is possible to make any ordinary shoes in from ten to fourteen days. Many will dispute this assertion, but the fact remains that with adequate supervision and the necessary facilities, such speed is not only possible but practical. The savings from such speed are obvious.

Tracers

When no provision has otherwise been made for the quick passage of special cases, special pairs, or trial shoes, and it is necessary to make them in a very short period of time, they may be followed by means of a Tracer.

What form the Tracer takes depends largely on what it is to be used for, but in any event, it is what may be termed a special Sheet System in itself.

Inasmuch as these shoes pass through the factory much more rapidly than the ordinary schedule calls for and inasmuch as the use of a Tracer becomes more or less a burden upon the heads of departments, it has been found to be a good scheme to have a tracer system in charge of the telephone operator. As shoes pass from station to station, the

telephone operator may be notified in any convenient manner and records kept by her. If they fail to pass according to schedule, it then becomes her duty to notify the department at fault. In this way it is usually possible to get quick action.

Checking Stations and Checking

By "Checking Stations" is meant points located in different parts of the factory where the passage of shoes is recorded. They should be so located that the passing of shoes is recorded at least once each working day. Some departments will require only one station, while other departments may require several. The method of conducting departments may also make it necessary to have several stations to take care of different parts of shoes.

In any event, each station should be provided with a suitable file for holding the copies of Production Sheets. These files may be easily made of board of convenient size, provided with spring clips, so that the sheets may be readily inserted or removed.

Some checking stations require very little information. In fact, sometimes almost nothing but the case numbers is needed, and for such stations complete copies of sheets need not be made.

As lots of shoes are completed and ready to pass the various checking stations, the case numbers are cancelled on the sheets. This shows at a glance just what cases are not completed. When all the case numbers on a sheet have been entirely crossed off, the sheet should be marked with the date and hour of completion and sent to the office for record. It is desirable that each station be provided with an automatic time stamp, as then all controversy as to the exact time when sheets are completed is avoided. It is also

a good custom to take sheets when completed to the foreman of the next department for his signature, this being an automatic notice to him that all the shoes on the sheet in question are in his department.

It should be unnecessary to state that all cases should be full and perfect before passing checking stations, or at least before passing the final checking station in any department.

When the sheets have been returned to the office, they should be recorded on the Factory Calendar by noting thereon either the date and hour of completion at the stations to which they belong, or by noting the time in hours that they are ahead of or behind the schedule, the entries of delayed work being made in red ink. If this method is pursued, the Calendar will show at a glance the record of performance and the perfection with which departments are operated. Results may also be recorded on charts if preferred.

Such in general is an outline of the principal features of operating a Production System. The actual details of operation depend so much on existing conditions that it seems rather impractical to attempt to go into it so minutely as to describe them.

Summary

The success or failure of any Production System depends largely upon the carefulness with which the planning is done and upon the faithfulness with which the plans are carried out.

Running a factory by a Production System is quite similar to the operation of a railroad, and the railroad to be successfully operated must of necessity adhere closely to its train schedules.

As in the case of a railroad, if anything occurs to dis-

turb the sequence of affairs, means must be provided to straighten out matters.

Necessary as it is to adhere to fixed schedules, it must not be presumed that a well-operated Production System is not extremely flexible; on the contrary, almost anything may be accomplished without creating serious disturbances.

Many things may be done to facilitate operation. Convenient case numbering schemes, the use of colors, etc., may be made of considerable assistance.

A great many factories are being operated on what are called "Sheet Systems," but which in reality are not sheet systems at all. They may use sheets, but without any system.

The sheet system in many instances consists merely of tabulating on sheets of paper the case numbers, with usually some other details of the shoes placed in the works. These sheets are then distributed through factory departments and more or less endeavor is made to pass shoes through the works in the rotation of the sheets. This is sometimes possible, but more often impossible, simply because enough time and study have not been expended in planning.

There is nothing to be gained by having a Production System which is more elaborate than is necessary to produce desired results. On the other hand, there is something lacking if the desired results are not achieved and, of course, the actual degree of perfection to be attained depends largely upon each individual's conception of perfection.

A good Production System closely followed is without doubt one of the greatest, if not the greatest, of aids in producing shoes, but if it is not carefully planned and well executed, it is apt to become more of a joke than anything else.

Chapter 16

CUTTING DEPARTMENT

TWO expressions have been repeated so frequently that they have almost become maxims. One is, "The cutting room is where profits are made or lost"; the other, "The cutter can easily throw his wages on the floor." These two expressions indicate the importance with which manufacturers have always regarded the Cutting Department. No one questions that it is one of the most, if not *the* most, important department in every shoe factory. It became even more important with the introduction of the clicking machine, because of its tremendous product and low labor cost. While all shoe manufacturers have considered the Cutting Department to be of the utmost importance, they have, in altogether too many instances, failed in their attempts to get the greatest value out of the raw stock consumed. The chief reasons for these failures have been — first, ignorance; second, misconception of the ratio of cost of material to cost of labor; third, unwillingness to provide accurate data showing what the cutting room produces, and the costs.

In considering these three causes of failure, it is well to remember that the shoe manufacturing business, unlike many other industries, has developed from individual shoemakers to the factory system in a comparatively short time. When shoe manufacturing under the factory system was in

its infancy, many other lines of industry had reached a point of comparatively high development, and have, consequently, reached a higher state of perfection to-day than has the shoe business, despite its remarkable growth. One of the chief reasons for this is that hides and skins were always classed as a by-product and the making of footwear, compared with other industries, was not looked upon as being a high-class trade. The same holds true to a greater or less extent even to-day, and as a result it is difficult to find men technically trained to handle leather with mathematical precision. The requisite training for high positions in nearly all other industries is accomplished not alone by practical experience, but by high-grade technical and trade schools as well. Whatever development has taken place in the shoe industry has been brought about largely through the accomplishments of trained mechanics and mechanical engineers in the construction of machinery, resulting in the necessity of a more systematic conduct of the factory as a whole, and bringing the construction or actual putting together of shoes on to a comparatively high basis.

In the Cutting Department, however, there has not been such marked advance. There have been some improvements in the cutting-room equipment, such as better patterns and cutting boards, and notably in the introduction of the clicking machine, but the leather itself in the great majority of factories is handled in much the same way as it was years ago.

Considering the circumstances surrounding the growth and development of shoe manufacturing, one realizes that the manufacturer is hardly to be blamed for the first cause of failure mentioned above. The manufacturer cannot be expected to be a highly trained, technical man himself, and he has not had the advantage that men in other industries

have possessed of calling on trained assistants. We cannot, however, excuse him for failure because of the second and third reasons.

Good judgment, based upon accurate figures, is all that is necessary to decide the best course to pursue in regard to labor. Improvements in machinery have always been followed by a reduction in the price paid for operating it. While a reduction in the price paid for operating a machine may produce disastrous results if the reduction exceeds a logical point, it may not incur such serious consequences as would a reduction in the labor of handling valuable raw material. The labor cost of cutting leather is a small per cent of the material cost, and the saving made by reductions in the price of labor, has, in many cases, been problematical, if not resulting in an increased cost of product. It is the invariable rule, when cutters receive a lower piece price, to increase the speed of working, and to use less care in the placing of patterns; the result is the use of more stock than necessary, the production of uppers of an inferior quality, or both. A reduction in the price paid for day labor means, other things being equal, the employment of cutters of inferior ability, with the above results. The ratio between the cost of material and the cost of labor is a very vital problem, and one which requires exceedingly careful consideration.

To the third cause of failure many manufacturers are indebted for their non-success. While a great many manufacturers are ignorant of the proper methods of keeping informed as to the actual conditions in the cutting room, many assume that the clerical labor involved is a useless and unnecessary expense. Whenever cutting-room systems are mentioned to such manufacturers, they throw up their hands in holy horror and exclaim, "Red Tape!" They will

tell you that they keep such a close watch of the cutting room that nothing can escape their attention.

A careful consideration of the difficulties confronting any manufacturer in his cutting department will convince the most sceptical that, to keep fully posted, he must have information other than that obtained by the eye and ear. The cost of the upper is one of the principal items, in most instances the greatest single item, which enters into the construction of a shoe. The modern contractor or engineer can tell, with wonderful accuracy, the amount of material required in any kind or size of building, railroad, ship, or whatever he may be about to construct. How many shoe manufacturers can tell, with anything like a relative accuracy, the amount of leather from which a given case of shoes may be cut? It may be argued that the value of the material in the case of shoes is a small amount compared with the value of the material in a modern skyscraper, but it should be remembered that in constructing thousands of cases of shoes, the aggregate cost of material amounts perhaps to the cost of the material in a skyscraper, which is also composed of units. The gain or loss of a relatively small per cent on each case of shoes will make a big difference in profits at the end of a year.

There are many factors which cause profits or losses, among the most important being the quality and clearness of the leather and size of the skins cut, the combinations of patterns used, the sizes and widths produced, the way the work is given to the cutter and the ability of the latter.

It is clearly evident that the manufacturer needs be continually on guard and fortified with as complete information as possible.

It will not be amiss to consider some of his difficulties and their solutions. One feature which manufacturers strive

to gain, and which often presents a most serious problem, is uniformity of product. Years ago when nearly all shoes were handled through jobbing houses, many manufacturers made a practice of having two or three inferior pairs of shoes in each case. Nowadays many manufacturers sell their product direct to retailers and consequently are compelled to produce more uniform shoes. The jobber is likewise demanding them, and up-to-date manufacturers strive to have every pair of shoes uniform in quality and appearance. It is not expected that shoes can be made absolutely alike; that is impossible, but they should be as nearly alike as they can be made.

Previous to the introduction of what may be termed "modern" leathers, a fair uniformity was gained by cutting shoes in bulk and sorting them afterwards. This method met with considerable success, not because of the method, but because of the material used. At the present time the same method would not be a success in many factories cutting modern leathers. There are so many varieties and styles of shoes that the complications make it impractical. As a consequence, the great majority of shoes are cut "to order" or by "tags," as it is sometimes called.

The feature of uniformity is complex. No two skins are alike, especially goatskins. The breed of animals from which skins are taken, the locality in which they are grown, the care they receive, the methods of tanning and finishing employed, all tend to produce leathers having a wide range of qualities.

The tanner sorts his product into many grades and weights, based primarily upon a selling value per foot. He naturally sorts his leather no finer than he is compelled, in order to run his business at a satisfactory profit, and he finds it more advantageous to sort for the general needs of manu-

facturers rather than to meet the conditions of any particular one. However careful his sorting may be, each bundle of leather contains skins which, for manufacturing purposes, are of many different values and cutting qualities. The manufacturer, in purchasing leather, endeavors to select that which will, as far as possible, meet his conditions and conform to his idea of quality. He may exert the utmost care in his selections, and still it is impossible to produce, economically, uniform shoes from the leather as he buys it.

There are several ways of dealing with this problem, the following being the most commonly used: requiring the cutter to produce uniform shoes of one grade from the leather as received; requiring the cutter to produce shoes of two or more grades at the same time; permitting the use of "Side Patterns" to use up inferior parts, and, the careful sorting and grading of the leather before cutting. This last method is, without doubt, the most satisfactory and economical. It is impossible to produce, without excessive waste, uniform shoes of one grade out of leather as it comes from the tanner, and if the cutter's judgment is relied upon to determine the proper quality, there will be a great variation, particularly if he is required to cut the leather up clean.

It is very difficult to find cutters able to produce several grades of shoes at the same time. The average result of this method of cutting is loss of distinction in grades. The cheapest grade will be too good, the best grade too poor, or very good and very poor may be mixed together. The use of side patterns is unsatisfactory in many instances. The pieces cut are usually considered of relatively little value, and it requires remarkably good judgment to place side patterns without taking stock which would be of much greater value in regular grades.

If, on the other hand, leather has been sorted and

graded for certain patterns and qualities of shoes, it is much easier for the cutter to work intelligently. No one will dispute the fact that a cutter kept continually at work on one kind of leather becomes more proficient than if shifted about from one kind to another. He becomes more proficient if kept on a certain style of pattern. His proficiency will be still further increased if the leather which he cuts is adapted to the pattern used and the skins are of uniform size, shape and quality. The less individual judgment cutters are required to use, the faster they can work and the more uniform and satisfactory will be the results. There is no question but that when leather is properly sorted and graded before cutting, the cost of uppers is reduced in both material and labor, and there is a growing tendency on the part of manufacturers to adopt this method. The degree of perfection which may be obtained depends upon the way the business is lined up. The manufacturer who specializes on standard lines has a much simpler problem than one who attempts to make anything and everything.

The ability of the cutter is judged from three standpoints,— quality of product, cost of material, and speed. He may excel on one point and lose on another, but when work is properly presented to him, it is not unreasonable to expect a correct and uniform quality at a pre-determined cost of material and labor. He should be assisted in producing quality by personal instruction from his foreman or assistants, and by access to standards kept for his inspection. The pre-determination of cost can only be made by means of an accurate system of allowances or, in other words, by accurate, mathematical calculation.

Many features fluctuate the amount of leather necessary to be used; for instance, variations in the sizes and widths

of shoes, the combinations of patterns used, the sizes of the skins cut, etc. It is easy to perceive that a method of computing allowances which will take these diversities into consideration is exceedingly valuable. When one considers that it costs approximately 65% more to produce the largest size and widest width, than to produce the smallest size and narrowest width, in a factory making shoes of five different widths, and a proportionate amount in other factories, it is easy to realize the necessity of a system of allowances. The variation between extremes amounts in some cases to over 70 cents per pair. It would undoubtedly surprise the majority of manufacturers if they knew that in round numbers 33% of the leather cut goes into waste; that is, does not go into the outside of the shoe. Of course, the amount of waste varies more or less in different factories, but it is safe to say that in no factory does it average less than 25% and in many is as high as 45%. This percentage is, of course, figured upon the actual area of the leather cut. The percentage of waste varies with the kind of leather used, and may also vary on different sizes and widths of the same pattern.

Some manufacturers have long realized the necessity of reducing the production of cutters to a mathematical requirement, and as a result there are several methods in use by which attempts are made to know what should be allowed for different sizes, widths, leathers and grades. Various factors have been employed as bases, the three most commonly used being area, weight, and a percentage ratio of one size to another. None of these bases are sufficiently accurate to be reliable. While, of course, the area of a pattern has a great deal to do with its cutting value, there is another factor which has been largely overlooked. This is the shape or contour of the pattern.

Weight, as will be readily seen, is merely another method of indicating area, and of necessity possesses all the inaccuracies of area and many more. The ratio method, used in the form of a percentage table, is inaccurate because the cutting values of all patterns do not grade alike, hence, a table correct for one pattern will not necessarily be correct for another. In fact, the inaccuracy may amount to as much as ten or fifteen per cent, in some cases even more.

In order to understand fully the problem of determining accurate cutting allowances, it is necessary to study the construction and measurements of lasts. Lasts are generally made with certain measurements known as "standard" measurements, and are supposed to fit the requirements of the greatest number of feet. There is, however, a great diversity in the styles of lasts; even if made to conform to standard measurements they may be, and are, varied in other ways to suit individual ideas and factory conditions, so that patterns to fit them must of necessity grade differently, so far as cutting allowances are concerned. If the actual area of patterns is taken as a basis, it will be found, by careful testing, that while in some instances a large size of a certain width wastes a considerably greater percentage of leather than a small size of the same width, in others the reverse will be true; that all sizes of any one width *may* waste the same percentage, but that the percentage for each different width would vary. This variation in the waste is not due to the area of patterns, but to their shapes, therefore it will be seen that it is impossible to build one percentage table covering these variations. Percentage tables are based primarily upon the area of patterns. A certain size and width is selected as the average size of shoes produced, the amount of material taken to produce uppers of this size being given a value of one. The value of every

other size and width is a percentage of this average size. When this method is used the rate of increase from size to size is the same for all patterns, which is manifestly incorrect. That this inaccuracy actually does exist has been proved time and again by manufacturers using the percentage table method. They have found that while it may require no skill on the part of a cutter to produce some sizes and widths, it is absolutely impossible to produce others within the allowances. This is caused by the variations mentioned above, and can, perhaps, be better illustrated by the following diagrams in which a dotted line figure is used to represent the grade as taken from a percentage table. The corners A, B, C, D represent respectively the smallest and largest sizes of the narrowest and widest widths. The average size is represented at *o*. The diagonal E-F is the line along which the relative values of sizes and widths are equal to the average size *o*. Consequently all sizes and widths above the line E-F have a value less than the average size, and all below, a greater value. The heavy line figures indicate the comparative forms which percentage tables made for some particular patterns might take, and from the three figures given it will be seen that there may be a great diversity. These three illustrations were made from actual patterns but do not, by any means, indicate the great number of such figures which might be constructed; as a matter of fact, the careful examination of several thousand sets of patterns has shown no two which grade exactly alike. When using the Percentage Table Method, it is evident that the rate of increase from any given size to another is always the same, regardless of pattern or leather. The amount of the increase, expressed in feet, will vary for the pattern or leather used, but the rate per cent is always the same. Actually, the rate varies from as low as two-tenths of 1%,

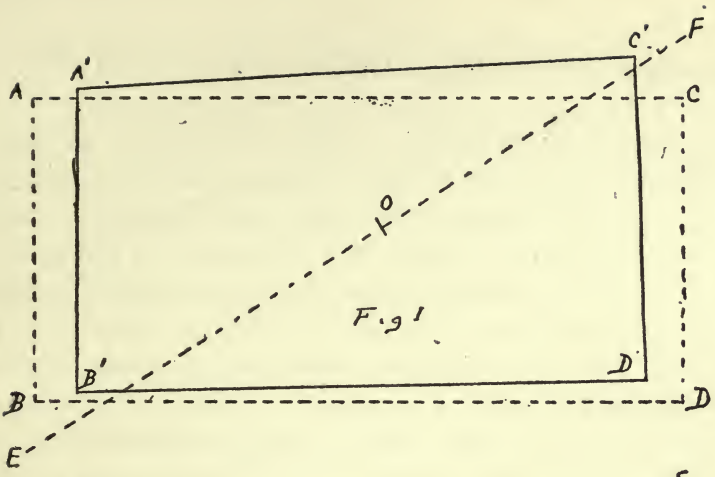


Fig I

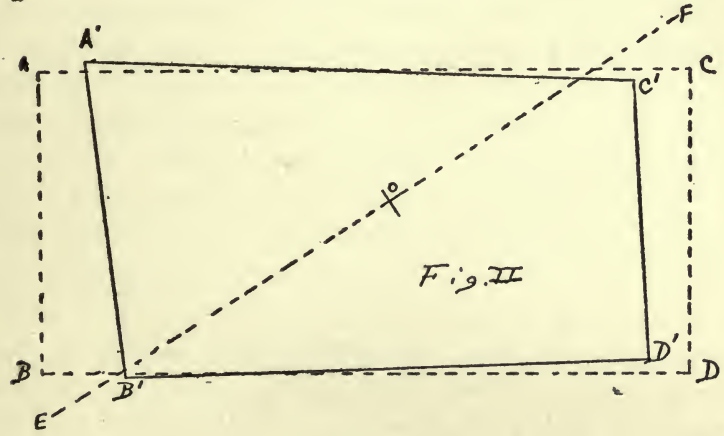


Fig. II

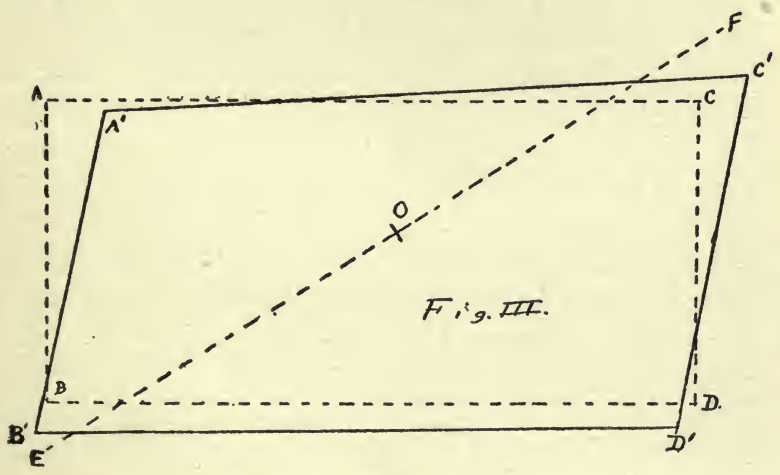


Fig. III.

to over 5% for a half size. This rate of increase may in some instances be the same for all widths of a set of patterns, in other instances the percentage may increase for wider widths or it may decrease, and in some cases the grade is backward; that is, paradoxical as it may seem, the smaller sizes require greater allowances than the larger ones. It will be seen that a pattern which requires two and one-quarter feet of leather to produce a certain size, *may* require .0045 feet more for the next succeeding half size, or it may require .1125. If the leather cost 25 cents per foot, this increase would vary from approximately one mill to about three cents for one-half size. Surely a great difference. What this rate of increase is, cannot be determined by looking at a pattern, or by measuring it.

It is necessary, moreover, in making allowances, to take into consideration the combination of patterns which are to be used in cutting. By this is meant the variety of different shapes. A given pattern may cut alone, for a certain waste per cent, but if cut with another pattern its waste per cent might be very different. For this reason it is not correct to make fixed allowances for patterns cut alone and use these same allowances when several patterns are cut together. The allowances for any given pattern vary according to the other patterns with which it is cut, that is, for each separate combination. If allowances are not correct, no one will find it out more quickly than the cutter, and when he has once found them to be incorrect, he ceases to be guided by them. Some manufacturers consider that an accurate allowance system is of value only in so far as it enables them to hold their cutters down to certain figures. The real value lies no more in this feature than it does in furnishing the purchasing agent with exceedingly valuable data to assist him in buying leather, and any system

which fails to give this information falls far short of what it should be. Some men are naturally better judges of leather than others, but no man, however expert, can buy leather to as good advantage if he relies solely upon his instinct, as he can if guided by accurate figures showing what can and cannot be done with the different kinds of leather which he buys.

The only figures of value are accurate figures. Inaccurate ones are worse than none. There is an old saying that "Figures don't lie." It is nevertheless true that "liars make figures." Not that figures are intentionally falsified, but inadvertently so because of lack of knowledge as to what they really mean, and in no department of the factory are inaccurate figures so misleading as in the cutting room. The expense of compiling accurate data should be considered in no other light than a form of cheap insurance against waste and excessive costs. There is no return which warrants the expense of making inaccurate records.

A great many manufacturers unwittingly show their appreciation of correct figures by refusing to believe the ones they make, which they know are not to be relied upon. How often in talking with a manufacturer do we find that he estimates the cost of his shoes on one priced leather and actually makes them out of a lower priced leather so as to be "safe," as he calls it. There are many manufacturers who are accustomed to figuring this way, and this fact alone shows that the figures which they make are unreliable. Compare the position of such men with the one who has figures upon which he can rely and upon which he actually makes estimates of costs.

This second man is in a position to beat his competitor every time, as far as the cost of producing is concerned; in other words, he knows what his goods cost him, and is not

obliged to place his estimate unreasonably high in order to insure himself against loss.

Another feature often overlooked, is the increase or decrease of an allowance, due to substituting a cheaper or higher priced material. That an increase or decrease is necessary, when a cheaper or higher priced material is used, goes without saying, and every manufacturer should be prepared to determine at a moment's notice what that increase or decrease amounts to.

Another source of expense and much annoyance in the cutting room is the method employed to keep track of patterns. In a large factory making many different styles, this is a very serious proposition, and in many cases men are employed who do nothing except to see that the cutters receive the right patterns. This is all very well so far as it goes, but in many instances the nomenclature and method of numbering is so complex that no one but an expert can fill the position. Such a condition of affairs is very unsatisfactory, for if this employee should, for any reason, be discharged or be sick, the cutting room is immediately in a turmoil and many expensive mistakes are made.

The best method of numbering patterns is, without question, what is known as the "group number" method. This method is exceedingly simple and enables any one to tell the exact parts which go to make up any given shoe, and the number which will appear on each piece of pattern to be used. A glance at the factory tag is all that is necessary to identify positively just what is to be cut. The advantages to be gained by such a system of numbering are so self-evident as to require no discussion whatever.

An efficient tag and sheet system is of untold value in conducting a cutting room, and the results attained in this

department have an effect upon other departments which must not be underestimated.

The system of production used has much to do with factory economy and no less in the cutting than in any other department.

Many manufacturers pride themselves upon having a small office force. An investigation usually shows a deal of clerical labor performed by foremen and workers in the cutting as well as other departments.

This is not economy. There is one place for the clerical force,— the Factory Office.

The foreman should have no clerical work to perform; he should devote his time to the cutting of leather.

Upon the efficiency of the Cutting Department depends to a large extent the economical conduct of the Fitting Department. In many factories one sees a veritable stream of people passing between these departments; this expense should be almost entirely eliminated.

Chapter 17

SOLE LEATHER DEPARTMENT

THERE are almost as many opinions as to the proper method of handling Sole Leather as there are sole leather men. The methods used depend largely upon the individuality of the man in charge, and the foreman who is successful in one factory is sometimes a failure in another making the same kind of shoes, simply because the conditions are such that his ideas cannot be carried to a successful conclusion.

The problem of managing a Sole Leather Department depends largely upon the kind of shoes produced. In making some classes of footwear, it is more advantageous to purchase the material all cut; in others it is practically impossible to buy cut stock. This, at the start, requires radically different methods of procedure. If cut soles are used, it is merely necessary to get them in shape to attach to the upper. Of course, wasteful methods may be employed in such instances, and the elimination of this waste depends upon the information with which the foreman and purchasing agent are supplied and upon their ability to handle the material to the best advantage.

If the soles are cut in the factory, the complication likely to arise is considerable. One sole leather man will advocate blocking the soles with a die, sorting them for quality and grading for thickness, and carrying in the store

room a supply of cut soles from which to meet the requirements of the tags.

Another sole leather man will oppose this method, and insist that the only proper way is to strip the sides, rounding the soles, as required, from these strips. The success of either method depends almost wholly on the factory conditions and the ability of the man in charge to place each part of the side where it belongs, even down to the scraps. Most men have no scientific basis from which to work.

A small manufacturer, making a limited line of shoes, finds it difficult to cut his own sole leather from sides, because he has no place to use the offal and soles not of the quality he requires.

Theoretically, at least, it would seem as though soles can be produced at a lower cost by block cutting than by stripping and rounding; but, when we consider the disadvantages arising, the apparent saving does not always materialize. The other method would apparently mean a higher cost sole, but it also means no surplus stock, and, if cropped leather is used, very little offal to dispose of. Frequently costs are figured incorrectly and manufacturers are deceived into operating under wrong methods because they are misinformed.

As stated above, the results produced depend very largely upon the man in charge, but whatever his method may be, it must harmonize with the methods employed in the rest of the factory. The product of the Sole Leather Department may cause an endless amount of trouble in the making and finishing rooms. Oftentimes the Sole Leather Department which is apparently run very efficiently causes serious hindrances and losses to other departments before the shoe is finally completed and ready to ship.

When a sole leather man is asked his reasons for manip-

ulating leather by the method which he employs, he can rarely give any satisfactory answer or figures to demonstrate that his method is the correct one. A man of ability in this line should not only demonstrate with figures and by tests the advantages of his method, but he should just as promptly demonstrate the disadvantages and errors of other methods.

In the majority of Sole Leather Departments there is a continual waste of material and labor, because of the lack of absolute standards to work by, which are nothing more than statistical knowledge of the possibilities of combining sole leather with labor in the process of manufacturing. That it is not impossible to have such figures is proved by the fact that there are *some* sole leather men who show positive figures in proof of their contentions. These men are very valuable and command big salaries.

A great many factories produce the fitted bottom stock long before it is ready to attach to the upper. Under all ordinary conditions this seems to be a very serious mistake, especially in making McKay sewed shoes, as the stock must necessarily become dry and difficult to work, and each successive wetting deteriorates the quality very rapidly.

Under proper conditions — which can be brought about in any factory — the fitting of the bottom stock should not be completed very long before the time for attaching. This insures its being in the most perfect working condition.

The method of obtaining costs in the Sole Leather Department is comparatively simple, the value of the product being dependent upon size, quality and iron.

Much that is true of the Upper Leather Department is true of the Sole Leather Department.

A bonus for saving is here just as applicable and valuable as in the Upper Leather Department.

Much confusion exists in the minds of shoe manufacturers, cut sole manufacturers, and cost men over the values of sole leather. It generally happens that a concern, buying sides of leather, does not have any accurate or scientific method of establishing the values of the various parts of the sides.

There have been many instances where profits have been made in cutting certain parts of the side of leather, and losses made on certain other parts, purely by placing inaccurate arbitrary values thereon. Shoe manufacturers who cut their own soles are really attempting to cut soles in competition with the cut sole manufacturers. They claim that they can produce soles cheaper than they can buy them. In many cases, they are deluding themselves into the belief that they are doing it cheaper, simply because they do not keep correct cost accounts.

The shoe manufacturer who cuts soles has identically the same costs as the cut sole manufacturer, and the only figures that he should not include in his cost which the manufacturer of cut soles carries are Profits and Selling Expenses.

It is fair to assume that the cut sole manufacturer has a better output for all parts of a side than the shoe manufacturer. It sometimes happens, however, that the heel or counter manufacturer who buys the offal from the sole cutter makes a larger percentage of profit than the sole cutter.

It seems rather unreasonable to expect that a shoe manufacturer can buy sides of leather or offal to so much better advantage than the sole cutter or the heel and counter manufacturer, that he can cut soles and make heels, counters, etc., cheaper than the men who are specializing on those parts of a shoe. The evidence which has been accumulated from time to time proves that the shoe manufacturer is

wrong. Unless he is a large producer he cannot compete with them.

Theoretically, the cut sole manufacturer should be able to supply the wants of all shoe manufacturers, except possibly the largest, but in practice it often happens, especially with the shoe manufacturers who are using hemlock soles, that they cannot buy them, and are, therefore, forced to cut their own.

The time will undoubtedly come when a tanner will take care of this condition by retaining all the profits which are to be gained in the various processes of cutting up and selling a side of leather.

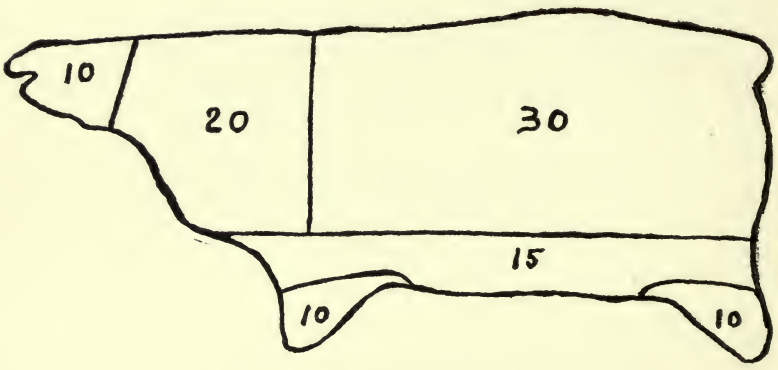
Theoretically, again, the tanner should be a cut sole manufacturer, a heel, counter and lift manufacturer, and sell all of his hides as finished product, instead of selling them whole.

Sole cutters and shoe manufacturers are about equally lacking in the knowledge of the relative cost of producing a certain size, iron and width as compared with certain other sizes, irons and widths. Neither do they know, as a rule, the difference in the waste of one die as compared with another, all of which information has been tabulated and can be applied to any case.

In publishing the chart given herewith, any analytical expert must bear in mind that it is an arbitrary cost chart. This chart was made on the hypothesis that the various portions of a side of leather are worth in cents per pound the values as given in the diagram.

For practical use this chart is not sufficiently accurate to obtain satisfactory results, and is shown merely as an illustration of what may be accomplished. For daily use it would be found more convenient if constructed on a basis of unity.

Such charts can be constructed for each sole cutter or shoe manufacturer, and are very valuable.



No. 2243-1-208. Small, Nichols & Co., Inc. 183 Essex Street, Boston, Mass. Industrial Engineers.

CHART OF SOLE VALUES

SCALE	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350	360	370	380
IRON 1	001	002	002	003	004	005	006	006	007	008	009	010	010	011	012	013	014	014	015	016	017	018	018	019	020	021	022	022	023	024	025	026	026	027	028	029	030	030
2	002	003	005	006	008	010	011	013	014	016	018	019	021	022	024	026	027	029	030	032	034	035	037	038	040	042	043	045	046	048	050	051	053	054	056	058	059	061
3	002	005	007	010	012	014	017	019	022	024	026	029	031	033	036	038	041	043	046	048	050	053	055	058	060	062	065	067	070	072	074	077	079	082	084	086	089	091
4	003	006	010	013	016	019	022	026	029	032	035	038	042	045	048	051	054	058	061	064	068	070	074	077	080	083	086	090	093	096	099	102	106	109	112	115	118	122
5	004	008	012	016	020	024	028	032	036	040	044	048	052	056	060	064	068	072	076	080	084	088	092	096	100	104	108	112	116	120	124	128	132	136	140	144	148	152
6	005	010	014	019	024	029	034	038	043	048	053	058	062	067	072	077	082	086	091	096	101	106	110	115	120	125	130	134	139	144	149	154	158	163	168	173	178	182
7	006	011	017	022	028	034	039	045	050	056	062	067	073	078	084	090	095	101	106	112	118	123	129	134	140	146	151	157	162	168	174	179	185	190	196	202	207	213
8	006	013	019	026	032	038	045	051	058	064	070	077	083	090	096	102	109	115	122	128	134	141	147	154	160	166	173	179	186	192	198	205	211	218	224	230	237	243
9	007	014	022	029	036	043	050	058	065	072	079	086	094	101	108	115	122	130	137	144	151	158	166	173	180	187	194	202	209	216	223	230	238	245	252	259	266	274
10	008	016	024	032	040	048	056	064	072	080	088	096	104	112	120	128	136	144	152	160	168	176	184	192	200	208	216	224	232	240	248	256	264	272	280	288	296	304
11	009	018	026	037	044	053	062	070	079	088	097	106	114	123	132	141	150	158	167	176	185	194	202	211	219	229	238	246	255	264	273	282	290	299	308	317	326	334
12	010	019	029	038	048	058	067	077	086	096	106	115	125	134	144	154	163	173	182	192	202	211	221	230	240	250	259	269	278	288	298	307	317	326	336	346	355	365
13	010	021	031	042	052	062	073	083	093	104	114	125	135	146	156	167	177	188	198	208	218	229	239	250	260	270	281	291	302	312	322	332	343	354	364	374	385	395
14	011	022	034	045	056	067	078	090	101	112	123	134	146	157	168	179	190	202	213	224	235	246	258	269	280	291	302	314	325	336	347	358	370	381	392	403	414	426

NOTICE: The top line of the chart, herewith, is the "L & S Scale" of patterns from 10 to 380 with increases of ten. On the extreme left are the different irons from 1 to 14, inclusive.

Opposite each of the irons are arbitrary prices per pair in cents and mills for that iron for a pattern of the "scale" at the head of the column. To get the scale of a pattern use the L & S Method. Then to find the average price of the soles, etc., per pair, find the cost of the part of the side from which they are usually cut. For instance, a good sole must be cut from the bend, marked 30. This chart is the "L & S Scale" on a 30-cent value for the bend; therefore, if a sole is cut from the bend at 30 cents, the cost of a pair of men's soles scaling 320, Iron 8, is 205 (20½ cents). The value of insoles, taps, counters, top pieces, etc., may be readily ascertained.

Chapter 18

MAKING DEPARTMENT

THE Making Department includes everything except the Cutting and Sole Leather Departments. While these two departments can be run in poorly constructed factories and a fair degree of speed maintained, it is impossible in the making rooms to get the best speed unless the construction is good. Although every manufacturer is striving for speed, and still more speed, there are very few who are getting the maximum amount.

The Upper Leather and Sole Cutting Departments may be filled up with tags or tickets, large quantities of uppers may be cut and many soles produced, but a big volume of shoes cannot be manufactured unless the Making Department is so arranged that it can take care of these uppers and soles. Manufacturers are often heard to complain that they cannot get shoes through the stitching room, that they are tied up in the Lasting Department, that the heeler is blocked or that the edge trimmers are behind time, etc. Nine times out of ten an investigation shows that the trouble is the same as would befall a ship if the captain were without a compass or rudder. Many manufacturers attempt to run this department without a sheet system, or with a very inferior or indifferent one, with no systematic or carefully compiled office records to show what are the capacities of the various departments. The result is that some one is

always chafing because it is impossible to get work through on time, and the help are dissatisfied because they do not get the work that they should have in order to earn the pay they are entitled to earn. A factory running under these conditions is like a large bottle with a small neck. Fill it full of water and then attempt to empty it quickly. You will find that you can never get more water out of the bottle than will pass through the neck. Tip the bottle bottom up or shake it, but what do you get? More noise and gurgle, but less water.

The same thing is applicable to the shoe factory. Pouring seven thousand pairs of uppers per day into the stitching room when that department is only equipped to turn out forty-five hundred pairs, or pouring forty-five hundred pairs per day into the lasting room when that department is short of lasts, and then attempting to rush some shoes, brings about the same result as described above.

The Heeling Department cannot take care of as many shoes if all shapes and heights of heels come along indiscriminately, as often happens. If the edge-makers are obliged to change their machines very frequently, it is impossible to get up speed at this point.

Years ago a certain patriot said that "eternal vigilance is the price of liberty." The price of a well-organized Making Department is also eternal vigilance, but it is absolutely necessary that that vigilance be helped out with system. The barometer must be properly adjusted and the chronometer set to run accurately or the work will not go through without unnecessary delays. Think of a system where a factory superintendent gets a production sheet sixty days ahead of the day he is to start making the shoes, showing him exactly what complications he is to have and just what he must do to have these shoes at certain points

in his factory at the day and hour they are required at those points, and some realization may be had as to why it requires only eight or ten square feet for each pair of shoes. Compare that with the conditions in other factories using thirty, forty and even sixty square feet to a pair of shoes. Is it to be wondered at that many manufacturers are finding it more and more difficult to do business? Some manufacturers are afraid of a "Trust in Shoes." If a "Trust" decides to manufacture shoes, it will have the necessary system for economic production at every point, but the office will not be the point where it will begin to do foolish economizing. The "Shoe Trust" manufacturing office will compare with the ocean liner's pilot-house, and be equipped scientifically to determine where the business ship is. If we should put one of our old-fashioned shoe manufacturers into such an office, he would be just as much out of place as an old-time sailing captain would be on the bridge of a modern ocean liner. This, however, is the manner in which shoe factories of the future will be managed.

The only successful method of running the Making Department of a modern shoe factory is under the system known as the Production or Sheet System. There are a multitude of advantages in this system, which in application mean that the administrators and executives are in control. A great many manufacturers have failed in the attempt to install and use the sheet system. Whenever they have failed, it has been their own fault. There have been many instances of failure solely because they refused to *properly* install the system and keep the necessary records of the capacity at each important point in the factory.

The system will not operate itself. Some factories making the most complicated lines have made a great suc-

cess, largely increasing their output, and making their employees better satisfied, by having a full day's work *each* day, instead of being driven to death one day and having half enough work the next. The system can be made a success in *any* well-organized factory if the management wants to see that the money invested in the office is saved in the factory by eliminating Non-Productive Labor and by producing a greater volume of shoes.

After the Production System was thoroughly installed in one factory, the productive capacity of the plant was increased 30%, and the time of putting shoes through reduced from an average of five or six weeks to three weeks.

Every room must be so arranged that work will rotate rapidly and without blocks or delays.

The line-up of machines can only be arranged after considering the kind of shoes to be made.

The system used must be one that eliminates Non-Productive labor, waste time, and waste space.

Chapter 19

CUTTING EFFICIENCY

By Charles H. Nichols

THE word "efficient" means the accomplishment of a fixed purpose. Consequently, the efficiency which is produced depends upon the given fixed purpose.

In discussing efficiency in the cutting room, we must necessarily consider the efficiency of three distinct things:

First, the efficiency of material.

Second, the efficiency of labor.

Third, the efficiency of expense.

I shall not touch upon the efficiency of the latter, except to call attention to the fact that expenses are to some extent incurred through the cost of equipment and that the greater facilities this equipment affords, the less will be the expense. Also that with a given expense the greater the production, the more efficient will be the expense burden.

The efficiency of material and labor are so closely related to each other that I shall not attempt to make a thorough separation of the two, but consider them to a greater or less extent together.

In order to consider clearly the efficiency of material and labor, we must first fix in our minds the proportionate cost of each; or to put it another way, the per cent that the cost of labor is of the cost of material.

As an illustration, I am going to consider for a moment

the manufacture of men's and women's shoes, without touching upon misses', children's, boys', youths', etc., but whatever facts we find about men's and women's will be true in proportion about other shoes.

Of course, you realize that conditions in various factories differ widely. Consequently, I shall take a general average, rather than the specific conditions found in any one factory. Also I shall consider only the cutting of the outsides.

The average cost of the upper stock in a man's or woman's shoe is in the neighborhood of 60 cents per pair, this figure being high for some instances and low for others.

The average cost of cutting the outside of the shoe is about three cents per pair, this figure being high for some instances and low for others. The labor cost of cutting outsides will vary from a little over a cent to in some instances 5 or 6 cents per pair.

With a material cost of 60 cents and a labor cost of 3 cents per pair, we find that the labor is only 5% of the material.

There is hardly a manufacturer who would not accept an opportunity of making a saving of 10% of the labor cost of cutting the outsides of his shoes. In the given illustration, a saving of 10% means a saving of three-tenths of a cent per pair. In a factory producing 3,000 pairs of shoes daily, this amounts to $9.00 per day, and for a period of 300 days, $2,700, not a very large item.

Suppose we could effect a saving of 10% in material. This would amount to 6 cents per pair, which with a production of 3,000 pairs per day, means a saving of $180 per day, or for 300 days a saving of $54,000, twenty times the saving of 10% in labor or 200% of the total labor cost.

It will undoubtedly be claimed that such a saving on

material is impossible, and it undoubtedly is in many instances. However, it has been and is being made right along.

Now what saving is necessary to equal the 10% in labor? Only one-half of one per cent. In other words, every three mills saved in the material of a pair of shoes equals 10% of the labor cost. Probably no one will deny that it is possible to make a saving of one-half of one per cent in material. It is, in fact, possible in any instance to save from one to five per cent. Suppose the saving is 3%. What does it mean? It means just six times as much as a saving of 10% in labor or on a production of 3,000 pairs per day, a daily saving of $54 or $16,200 per annum. Surely a considerable amount.

What is necessary to reach a reasonable degree of efficiency? From the meaning of the word "efficiency," we find that the first necessity is a fixed purpose. In other words, we must have a fixed task. Otherwise we can have no idea what degree of efficiency is being reached. Now the cutting of the shoe involves the use of both material and labor. We must, therefore, have the task include both material and labor, and the labor task must further be divided into the quantity of production and the quality of production.

In solving this problem of efficiency of material and labor, we find that we have three important factors.

First, we have a material which is constantly varying in intrinsic value; that is, in value for the production of shoes. The material may all cost the same but because of some peculiarities it is not all worth the same for manufacturing purposes.

Second, we are cutting that leather into pieces of various shapes and sizes of which comparatively few have the same

value. That is, patterns of more than one shape and size are ordinarily used in cutting one job.

Third, we have the variation in the skill and speed of the labor used in the cutting.

In making a beginning of efficiency records, these three factors are of unknown value, and we must find what the values are. Only one of the three factors remains constant. That is the patterns. While these patterns vary in shape and in size, the given shape or size always remains the same, and, therefore, has a constant value.

There have been various means devised for ascertaining the value of different shapes of patterns. In the vast majority of instances these values are ascertained either by guess, by experiment or by some more or less crude method, such as marking them out on paper, Sometimes the area is found either by means of a planimeter or cross-section paper or weight.

It can easily be demonstrated that the area of a pattern has relatively little to do with its cutting value. In other words, patterns having the same identical area will vary tremendously in the amount of leather required to cut them. This method must then be eliminated from consideration.

Neither can we determine its value by such an experiment as a test cutting, because a test cutting involves the factors just mentioned, and the value of none of them is known.

It is evidently impossible to ascertain the cutting value of a pattern by merely looking at it and the old method of marking it out on a piece of paper is not sufficiently accurate, because given the same pattern, different people will determine different values, and we must have a method by which any number of different people will at all times arrive at the same value. Such a method I have devised,

but a demonstration of it would require considerably more time than is at my disposal, and a comprehension of its accuracy necessitates a knowledge of higher mathematics. The application, however, requires only a knowledge of grammar school arithmetic.

The values of different sizes of the same shaped pattern have been calculated in a large number of different ways, usually by making an arbitrary grade. That is, the value of one certain size is always considered a fixed per cent of another certain size, this value remaining the same regardless of the shape of the pattern. It can easily be demonstrated that such an assigned value may be and usually is far from accurate. Now it is evident that if we can determine the values of different shapes of patterns, we can just as easily determine the values of different sizes of the same pattern. We can, therefore, set absolute fixed values upon the patterns themselves. This eliminates one of our variables.

Before we can take up the question of labor, we must settle upon the method of handling material.

The value of this material as purchased varies constantly and until the time arrives when skins can be grown and tanned to fixed standards and the measurement of leather is more exact than at present, it will be impossible to *absolutely* standardize the exact amount of material necessary to produce shoes. We can, however, very easily make standards for the *use* of leathers. That is, we can make selections of various kinds, types and qualities of skins best suited to produce certain styles and qualities of shoes. Then by the law of error, the slight positive and negative variations from these standards will tend to neutralize each other, and we have for practical purposes a very acceptably standardized material. When this is done, we have solved two of our factors; namely, the patterns and the material.

The relationship between these two factors can be calculated, thus finding the minimum amount of a given material necessary to produce shoes of a given quality, style and sizes being considered.

In this way we eliminated one of the uncertainties of labor; namely, the amount of material which it should consume in producing shoes.

The speed with which labor should produce shoes depends principally upon three factors: The shapes of the patterns used, the materials used and the judgment and quickness of the cutter. These factors can only be determined by intelligent time study. But they can be determined, and when done we have reduced to mathematical formulæ the entire process of cutting shoes. In other words, we have placed ourselves in a position to assign the necessary task to get efficiency. It will, undoubtedly, at first appear that this process is long and complicated. However, it is not and is, in fact, done more or less thoroughly in every factory. The reason why a fair degree of perfection is not reached is because the principles of Scientific Management are not used.

The whole proposition may be summed up very quickly in the proper sorting and grading of material to meet the requirements of manufacture, the assigning of correct values to the different sizes and shapes of patterns and time studies showing the amount of labor necessary to cut shoes.

It has been the general tendency in the past to make economies in the cutting room, either through a reduction in the price paid labor or through a reduction in the quality of the shoes produced, neither of which in the long run gives satisfactory results. The saving which can be made in labor through a reduction of price cannot be very much, while the saving to be made in the consumption of material without a

reduction in the quality of shoes is a large amount. It would, therefore, seem logical to spend much more time and thought on the latter than on the former.

We have, however, to use labor in the consumption of material, and it is necessary to render that labor efficient, else our material cannot be efficiently consumed.

A little consideration will prove that it is very difficult to accomplish anything unless there is some suitable reward for the accomplishment. In the case of the employer, the reward for his work is the profit of his business; in the case of the employee, it is the amount of money which he can earn. We must, therefore, to get the best results, offer to the workman a reward sufficient to induce him to make the exertion necessary to accomplish the fixed task which means efficiency. What this reward should be varies, of course, in different grades of work, and in different localities; but in any event, if we wish to increase the efficiency of labor to any great extent, we must offer it a just reward for its efforts.

At the present time the tendency of organized labor is to limit the daily production of each cutter. This tendency has come about for a number of reasons, the principal ones being bad management and unsteady employment.

The claim is often presented that a cutter can work to advantage not more than eight hours per day, it being asserted that in the latter part of the day, especially in the winter time, it is impossible for a cutter to perform his work either well or rapidly. That this assertion is true, is, I am sorry to say, altogether too frequently the case.

In a great many factories after it is too late to work by natural light, the cutting room is as a whole dark and gloomy. The cutters are usually provided with either an open flame gas jet or an unsuitable electric light, which at best illuminates only a small area of his work bench, fre-

quently shining directly in his eyes, making it very difficult for him to see. In many such factories, we find the cutter rushing his work during eight hours of the day, and during the last hour or two either killing time or doing some unimportant job. In such instances as he is required to work as hard as possible up to closing time, we find that his production will drop from twenty to fifty per cent in speed, and fully that much in quality. Such conditions are wholly inefficient and entirely unnecessary. A very slight additional expenditure, usually not to exceed one half cent per cutter per hour, approximately the cost of cutting one-sixth of a pair of shoes, will provide illumination nearly equal to natural light, increasing the efficiency of labor to a very considerable extent. Each cutter has to produce only one extra pair of shoes to earn five or six hundred per cent on the increased cost of illumination.

Unsteady employment has been one of the chief reasons for limiting the daily production of cutters. It is not always possible to run a shoe factory so as to produce the same number of pairs of shoes per day throughout an entire year, but that this can be more nearly approached than it is in the majority of cases is an easily demonstrated fact.

It is the tendency in altogether too many factories to run the cutting room at full speed during about eight months of the year, and the packing room eleven or twelve. This means that the daily production of the cutting room while it is running is greater than the daily production of the other departments. It does not mean that the factory as a whole produces any more shoes than it would if the cutting room produced at the same rate as other departments. It also means that with a given daily production per cutter it requires the employment of more cutters than would other-

wise be necessary, which in turn means that these same cutters or a portion of them must loaf during part of the year.

I have observed in a great many instances that in localities where this custom prevailed, the cutters as a rule earn while working from thirty-five to fifty per cent more per day than they do in localities where conditions of steady employment prevail. This in itself means an abnormally high cost of labor. It also means an abnormally high cost of material, for to get the greatest efficiency out of the average cutter, he needs a considerable period of careful training. Under the short employment method he can only have reached the state where he has become efficient when his job gives out, and we have virtually thrown away all our efforts, in addition to making the cutter dissatisfied with his lot. Moreover, instead of increasing the promptness of shipments, the result is invariably the opposite, there being a congestion in all departments, reducing the efficiency of labor and machinery, delaying shipments. The manufacturer not only suffers loss of efficiency in cutting, but increases the cost in all departments, adds largely to his interest charges and in the end disappoints and perhaps loses his customer.

The best method of rewarding cutters for their labors has been a much discussed problem. Some manufacturers pay their cutters by the piece in order to keep their labor cost at a minimum. Other manufacturers pay by the day, claiming that they can save more than enough material to offset the increase in labor. Other manufacturers oscillate from one method of payment to the other.

Inasmuch as the cost of labor is such a small per cent of the cost of material, it would seem that this fact should be the first consideration in rewarding cutters, but as a matter of fact it has been considered in very few instances.

It is evidently impossible to gain the greatest efficiency under a piece price system unless the allowances for material have been reduced to the lowest practical point, and cutters are required to produce shoes for these allowances. It must also be necessary that the production of the cutter be as great as possible compatible with the quality of his work in order that the cost of production may come within reasonable limits, which we have seen is contrary to the tendency of the present time.

It is evidently impossible to reach the greatest efficiency with day labor unless the cutter produces the maximum amount of shoes and they must also be produced out of the least possible amount of material so that with either day or piece labor the results should be the same.

Under the piece price plan, the chief reward is for speed, under the day labor plan the chief reward is for keeping down the cost of material. Under neither plan is the cutter rewarded for keeping down the cost of both material and labor.

A logical plan is that the reward be based upon both speed and consumption of material or a bonus system.

Attempts to do this have been spasmodically made from time to time, but in no instance, that has come to my attention, have the results been satisfactory over any very long period of time. Either the reward for speed was out of proportion to the reward for material, or *vice versa.* In many instances, the reward for either one or the other has been paid at such remote times that it offered little inducement to the cutter. It is more satisfactory to pay any rewards which may be earned either for speed or saving in material at certain definite periods, and these periods of payment should be frequent, preferably weekly. It has been found that better results can be obtained if the cutter is in-

formed immediately after the completion of each job whether or not he has earned his bonus.

To fix the reward satisfactorily then, requires that three things be arranged.

First, the correct amount of material to be used.

Second, the correct amount of time to cut the material.

Third, the correct amount of reward to give the cutter for his efficient help in saving both material and labor.

NOTE: Since this speech was delivered one manufacturer at least has adopted the advice given, and is now saving 10% on the cost of his leather.

Chapter 20

UNIT AREA OF PRODUCTION

By John E. Kirwin

Published by Small, Nichols & Co., Inc., in 1910

SHOE manufacturers sometimes are at a loss to know whether or not they are making the best possible use of the floor space at their disposal. Careful investigations are made and the untiring efforts of the superintendent are enlisted. Frequently the concerns in doubt go outside and employ the services of men whose business it is to study, devise and improve systems with an eye to greater productiveness. This latter course is a very profitable investment, providing the men engaged are thoroughly conversant with the peculiar problem of producing shoes.

It is very natural that shoe manufacturers should want to know exactly where they stand, inasmuch as competition is extremely keen, and the margin of profit small. The race is, indeed, for the sure-footed no less than for the fleet-footed. A few suggestions may clear the situation. For instance, a manufacturer may perceive in advance that the price of materials is going to rise, and in this case he is confronted with the problem of "stocking up." Now, unless he knows down to a cent what it costs him to make his product, and unless he is informed down to a square foot as to

how much room it requires to move the work through to completion, he cannot wisely venture into the market and place heavy orders with a feeling of clear confidence. Lacking such precise knowledge of his own business, he falls into the habit of waiting and considering, with the result later of buying materials at advanced cost. Many manufacturers take long chances, and they stand to win or lose, but those best equipped with a precise conception of their productive capacity, and the cost per unit of product, are the men who seize opportunities at the right time and then push their competitors. It is well known that some men are classed as conservative who are prevented from acting because of a lack of complete understanding of their own working organization. Others are stigmatized as adventurers, who merely act quickly and decisively because of well-placed confidence in the efficiency of their productive power.

The point which is being driven home is that too few manufacturers know within a row of apple trees just how much floor space it takes to turn out a unit of their product, which is a pair of shoes. This is one of the units of productive efficiency which should be ascertained exactly.

The point just made involves a good deal. It comprehends all the parts of the factory, department by department, and their correlation. Much depends on the physical structure of the factory, in attaining the greatest departmental efficiency, or, in other words, an arrangement which might be admirably adapted to one shoe manufacturing plant would be the worst possible arrangement in another. It is, therefore, necessary for each plant to line up its forces to the highest productive advantage. Some observations on how certain factories are arranged may clarify these claims.

More and more the belief is gaining ground that the

cutting of the upper leather and sole leather should not be a working part of the factory proper. Hence, we note that some large firms are segregating the cutting unit from the organization proper. At present this arrangement seems to apply chiefly to concerns engaged on a large scale. The whole idea back of it is, of course, that so much money may be either made or lost in the cutting up of the leather that it should be made a separate department from all the rest of the factory. In other words, the leather should be received, checked, sorted and cut, and then be sold to the factory proper, just as though it were a purchase made outside. Needless to say, an unmistakable double check is hereby afforded on the most expensive material used in the process of shoe manufacturing.

In some factories that are built suitably it is found convenient to have the cutting and fitting departments on the same floor. Wherever this is in vogue it is noted that many of the operations usually done in the stitching room are transferred to the cutting room. Such operations as skiving, cementing, folding, lining and upper marking — which are preliminary factors in the work — are found to facilitate greatly the fast rotating of the shoes through the stitching room, if they are done in the cutting room. Investigations show that in many instances, where shoes are held up in the stitching room, the delay is to be traced to one or the other of the preliminary operations. When work is once well started in this department there is little fear of it being held up.

To carry the observations further, it is found that greater efficiency is often gained by having the making and the finishing departments on the same floor. Where such an arrangement obtains, poor edges or poor work of any sort may be pushed back quickly to the department from

which it just issued, without, it must be noted, the necessity of transferring on the elevator. Applying the same principle, an arrangement which provides for the lasting and stock-fitting departments on the same floor may be defended on the grounds of greater productive efficiency.

It is not deemed practical to go too much into specific details as this discussion is merely intended to furnish food for thought and to call attention to the fact that shoe manufacturers are in a position which demands the acquisition of every bit of detailed knowledge relating to their individual plants which it is possible for them to secure. The reason for this is, as we have pointed out, because the competition is becoming so great and because the net profits are being shaved so closely. It should be further stated that small factories are undeniably on the decrease, and there must be a good reason back of it.

Chapter 21

SOME PRINTED FORMS

IN writing the preceding chapters, the author has held to the idea, which he stated in Chapter 1 he desired to present to his readers: namely, to write a text-book by which a manufacturer could work out his own problems. Therefore, very few printed forms were included, in fact, only those which were necessary to illustrate the points described.

Friends who have read the manuscript suggested that it would add to the value of the book to some readers if more specific forms were shown; hence, the following pages.

Please bear in mind that while some of the forms can be called standard, most of them apply to specific cases only.

LAST ORDER (Form 15)

M _____ **No. 485**

SHIP TO BLANK SHOE CO., AUBURN, ME., WHEN _____
THE FOLLOWING ORDER OF LASTS:—

STYLE NO. _____ **DATE ORDERED** _____ **DEL. PROMISED** _____

1461-164 Small. Nichols & Co., Inc., Boston.

WIDE																			TOTAL

(861)

BLANK SHOE CO.

BY _____

APPROVED _____

ENTERED ON LAST INVENTORY

DATE _____

BY _____

ENTERED ON LAST LEDGER

DATE _____

BY _____

(Form 16) No 458

FINANCIAL REPORT

DATE 191

Small, Nichols & Co., Inc., Boston PARTICULARS	AMOUNT	
CASH		
BANK BALANCE ON NO.		
RECEIVED THIS DAY		
TOTAL TO ACCOUNT FOR		
DISBURSED THIS DAY		
BALANCE ON HAND		
REMARKS		
ACCOUNTS RECEIVABLE		
BALANCE		
CHARGES THIS DAY		
TOTAL TO ACCOUNT FOR		
PAYMENTS THIS DAY		
ADJUSTMENTS THIS DAY		
BALANCE		
REMARKS		
ACCOUNTS PAYABLE		
BALANCE		
INVOICES ENTERED THIS DAY		
TOTAL TO PAY		
PAYMENTS THIS DAY		
ADJUSTMENTS THIS DAY		
BALANCE		
REMARKS		
SIGNATURE		

(Form 17)

ORDER REGISTER BLANK SHOE CO.

Salesman Week of

Small, Nichols & Co., Inc., Boston

	ORDER NO.	CUSTOMER & ADDRESS	DIRECT			MAIL		
			PAIRS	AMOUNT		PAIRS	AMOUNT	
		TOTAL ORDERS FOR WEEK						
		" CANCELLED " "						
		" TURNED DOWN" "						
		" NET " "						
		" PREVIOUS ORDERS						
		" " CANCELLED						
		" " TURNED DOWN						
		" " NET ORDERS						
		" " " TO DATE						
		" CANCELLED						
		" TURNED DOWN						

(200)

(Form 18)

SHIPMENT REGISTER BLANK SHOE CO.

Salesman Week of

Small, Nichols & Co., Inc., Boston

	ORDER NO.	CUSTOMER & ADDRESS	DIRECT PAIRS	DIRECT AMOUNT		MAIL PAIRS	MAIL AMOUNT	
		TOTAL SHIPMENTS THIS WEEK						
		" RETURNS " "						
		" NET SHIPMENTS " "						
		" COMMISSION " "						
		TOTAL PREVIOUS SHIPMENTS						
		" " RETURNS						
		" " NET SHIPMENTS						
		" COMMISSIONS TO DATE						
		" NET SHIPMENTS TO DATE						
		" RETURNS " "						

(201)

(Form 19)

Shipping Date | Order No.

Customer No.

Address

Shipping Directions

Small, Nichols & Co., Inc., Boston

Tickets	✓	Sheet No.	Prs.	Case Nos.	STORAGE	
					Rack	Case
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
34						
35						

(Form 20)

SORTING REPORT

Kind **Lot No.**

Consignor **Date**

Doz. **Feet** **Price** **Amount**

Small, Nichols & Co., Inc., Boston

	KIND	Grade	Skins	Feet	Price	Value	Gain	Loss

(Form 21) **SORTING SLIP** *No* **962**

Small, Nichols & Co., Inc., Boston

LOT NO. **KIND** **NO. FEET** **PRICE** **COST**

	A			B			C			D			E		
	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z
H															
M															
ML															
L															
PROFIT															
LOSS															

(Form 22)

NAME_____ NO._____ DEPT._____

2224-10-30. Small, Nichols & Co., Inc., Boston.

DATE EMPLOYED WORK RATE PER WEEK

DATE												
Change of date												

ADDRESS _____

AGE_____ MARRIED, SINGLE, NATIONALITY_____

PREVIOUS EMPLOYMENT_____

_____

REFERENCES _____

APPEARANCE _____

WAGES EXPECTED_____ DATE APPLIED_____

DATE LEFT CAUSE

(Form 23)

INWARD PASS No.

This Pass must be presented to Foreman before beginning work. Pay will be reckoned from time of presentation to Foreman.

Name_____ No._____ Dept._____

Date _____

Received by Foreman

Time_____

Foreman's Signature_____

2222-10-30. Small, Nichols & Co., Inc., Boston

(Form 24)

OUTWARD PASS No.

This Pass must be presented at Office before leaving Factory. Pay will be reckoned from time of issue by Foreman.

Name_____ No._____ Dept._____

Date _____

Received by Office

Foreman's Signature_____

2222 A-10-30. Small, Nichols & Co., Inc.

(Form 25)

ERRORS ON WORK SLIPS

NAME_____ NO._____ DEPT._____

CORRECTIONS IN PRICE

2254-10-30 Small, Nichols & Co., Inc., Boston

WRONG PRICES			WRONG NO. PAIRS				
CASE NO.	FROM	TO	CASE NO.	PAIRS ON SLIP	CORRECT PAIRS	PRICE ON SLIP	CORRECT PRICE

THE FOLLOWING CASE NOS. ARE NOT CORRECT FOR REASONS GIVEN BELOW AND HAVE BEEN CROSSED OFF. SEND IN CORRECT NOS. ON NEXT SLIP.

CASES DONE BEFORE	NOT SO FAR ALONG	WORK NOT TO BE DONE	NO SUCH NUMBERS

TOTAL ON SLIP CORRECT TOTAL

(Form 26)

Lynn, Mass., _____ 1914

Received of **Blank Shoe Co.** No.

_____ *Dollars*

100

In full for labor to _____

_____

WAGES VOUCHER

(Form 27) **DELAYED PRODUCTION REPORT** No._____

Sheet No. Due out Dept. Station

Case No.	Sample No.	Prs.	Cause of Delay

(209)

	O
1	What is needed
2	New Inner Sole
3	Cobbled
4	
5	Operator
6	Welter
7	In Seam Trim.
8	Stitcher
9	
0	Cause of Damage
	Lasting
	I. S. Fit
	Poor I. S.
	Operator

Back

	Form 28
1	What is needed
2	New Inner Sole
3	Cobbled
4	
5	Operator
6	Welter
7	In Seam Trim.
8	Stitcher
9	
0	Cause of Damage
	Lasting
	I. S. Fit
	Poor I. S.
	Operator

Front

2401-33-30 Small, Nichols & Co., Inc., Boston

1 2 3 4 5 6 7 8 9 10

(Form 29)

RAW STOCK

NO. R. S.

KIND

BOUGHT OF

DATE	BAGS	LBS.	PURCHASE PRICE	AMOUNT	FREIGHT			
					PRO. NO.	DATE	LBS.	AMOUNT

	GAIN	LOSS
MFG.		
SALE		
TOTAL		

TOTAL COST

COST PRICE

BALANCE			
DATE	BAGS	LBS.	VALUE

DATE	NAME	BAGS	LBS. SOLD	PRICE	AMOUNT	GAIN	LOSS

DATE	BAGS	LBS. USED	AMOUNT	GAIN	LOSS	LABOR	
						GAIN	LOSS

CONTINUOUS CUTTING (Form 30A)

ENVELOPE *No.* 2035

KIND OF STOCK WIDTH

BOUGHT OF PRICE

LOT NO.	YARDS	LBS.	

CUTTERS NAME		POUNDS OFFAL
CUTTERS NO.		VALUE PER LB.

LABOR	YARDS OR POUNDS	MONEY
TIME	GIVEN	GROSS COST
RATE	RET'D	VALUE OFFAL
COST	USED	NET COST
ALLOW	ALLOW	ALLOW
GAIN	GAIN	GAIN
LOSS	LOSS	LOSS
		Small, Nichols & Co.

(Form 30B)

PATTERNS & PARTS	PRS.	INDEX	YDS. OR LBS, ALL'D	MONEY ALL'D
Small, Nichols & Co.				

(Form 31)

LOT NO.

SOLE LEATHER SORTING RECORD

NO.

KIND	PURCHASED OF	AMT.	COST PR.	TOTAL COST

KINDS	Small, Nichols & Co.												
	SELECTION												
DATE													
GAIN													
LOSS													

(Form 33)
Small, Nichols & Co., Inc.

SOLE LEATHER CUTTERS & SORTERS SLIP

No.

LABOR

Cutter
Time Started
Time Finished
Net Time
Rate
Cost

STOCK

Kind
Lot No.
Bought of
Lbs. or Ft.
Price
Cost

FLAT FIGURES

Allowance
Gain
Loss
Labor Allow. cut.
Gain
Loss

DETAIL FIGURES

Stk. Allow.
Gain
Loss
Sorter
Time Started
Time Finish
Net Time
Rate
Gain
Loss

CUTTERS RECORD			MENS							BOYS				YOUTHS		LITTLE GENTS				
PARTS		PRS.	12	11	10	9	8	7	6	5½	5	4	3	2	1	13	12	11	10	9
	Prs.																			
	Inch																			
	Iron																			
	Rej't																			
	Prs.																			
	Inch																			
	Iron																			
	Rej't																			
	Prs.																			
	Inch																			
	Iron																			
	Rej't																			
Offal	Kind																			
	Lbs.																			

(215)

Cutters Record (Form 34A) 1st QUALITY Small, Nichols & Co., Inc. 2nd QUALITY

STYLE	Size	Prs. Cut	4	5	6	7	8	9	10	4	5	6	7	8	9	10
Mens 9 Wd	10															
	8															
Mens Welt Reg.	12															
	11															
	10															
	6															
Mens Canvas	11															
	10															
	9															
	4															
Boys	2															
	13															
	10															
Youths	8															
W O S 30	7															
	5															
Misses	3															
	1															
	12															
Childs	10															
	8															
	6															
No. 75	2															
	13															
	11															
No. 75	9															
	7															
	5															

TAPS											
	Even	Name	No.	Time	Rate	Cost	All'w	Gain	Loss	2nd Read Meter	No. Prs.
	Sort	Name	No.	Time	Rate	Cost	All'w	Gain	Loss	1st Read Meter	No. Prs.

Time Taken (Form 34B)	Insole and Tap Cutting and Sorting No. 1052			Time Finished
	LABOR	POUNDS	MONEY	
	Name	Kind	Bought of	
	No.	Lot No.	Price	
	Time	Given	Cost	
	Rate	Ret'd	Value Offal	
Small, Nichols & Co., Inc.	Cost	Used	Net Cost	
Shrinkage	All'w	All'w	All'w	
POUNDS / MONEY				
Gain / Gain	Gain	Gain	Gain	
Loss / Loss	Loss	Loss	Loss	

CUTTERS RECORD			SORTERS RECORD				CUTTERS RECORD			SORTERS RECORD			
Style	Sizes	Prs. Cut	Solid	Gem	McKay	2 Pc.	Style	Sizes	Prs. Cut	Solid	Gem	McKay	2 Pc.
Mens New	6						Womens	8					
	7							7					
	8							6					
	9							5					
	10							4					
	11							3					
								2					
Mens Old	5						Misses	2					
	6							1					
	7							13					
	8							12					
	9						Childs	11					
	10							10					
	11							9					
Boys	5						Infants	8					
	4							7					
	3							6					
Youths	2							5					
	1						Mens Middle Soles	11					
	13							10					
L. G.	12							9					
	11							8					
	10							7					
	9							6					
	8							5					

LBS. OBTAINED		EVENING INSOLES			SORTERS RECORD		
Cut Stock	%	Name	No.		Name	No.	
Whole He'l'g	%	Time	Rate	Cost	Time	Rate	Cost
P'c'd Heel'g	%	2nd Reading Meter		All'w			All'w
Chips	%	Ist Reading Meter		Gain			Gain
	%	No. Pcs. No. Pcs.		Loss			Loss

Small, Nichols & Co., Inc. Boston

(Form 35)

TOP CUTTING

TAKEN

	LBS. OR PAIRS	MATERIAL		ESTIMATED		TOPS	
		PRICE	VALUE	PRICE	VALUE	LBS.	COST PER LB

RETURNED

LOT NO.	LBS.	PRICE	AMOUNT
STOCK COST			
MATERIAL VALUE			
GAIN		LOSS	
LABOR	TIME	RATE	
LABOR COST			
LABOR ALLOWANCE			
GAIN		LOSS	
STOCK COST			
LABOR COST			
ESTIMATED EXPENSE			
TOTAL COST			
ESTIMATED VALUE			
GAIN		LOSS	

(Form 36)

Heel Department Slip No. 511

Lot No. .....

Cutter .....

Date .....

Time .....

	Lbs. Given	Lbs. Received	
Whole Heeling			
Sheet Heeling			
Lea. B'd Heeling			
Lea. B'd Rand Stock			
Lea. Bd. Wedge Stock			
Split Heeling			
Oak Wedge Stock			
Leather Rands			
Skivings			
Whole Lifts			
½ Heeling			
Chips			
Total		Total	

(Form 37)

Heel Department Slip No. 755

STOCK SHEET

Date Received **Returned**

		Whole Lifts		
		Half Lifts		
		Oak Wedges		
		Lea. Bd. Wedges		
		Lea. Board Lifts		
		Leather B'd Rands		
		3-16 Heeling		
		Whole Split Lifts		
		Skiving Lifts		
		Cut Rands		
		Cemented Rands		
		Finished ½ Lifts		
		Paste		
		Nails		

(Form 38)

HEEL BUILDING H. B. No 564

SORTER'S COUNT

KIND SIZE

PAIRS PERFECT HEELS			PAIRS CRIPPLED HEELS			PAIRS DAMAGED HEELS		
TOTAL			TOTAL			TOTAL		

Small, Nichols & Co., Inc., Boston.

HEEL BUILDING H. B. No 565

Kind Size

Built by Labor. Total Lbs. Material

KIND OF LIFTS								
LBS. LIFTS GIVEN OUT								
TOTAL								
RET'D								
USED								
PRICE								
VALUE								

PIECE BUILDERS	LBS.	TIME TAKEN	TIME RETURNED

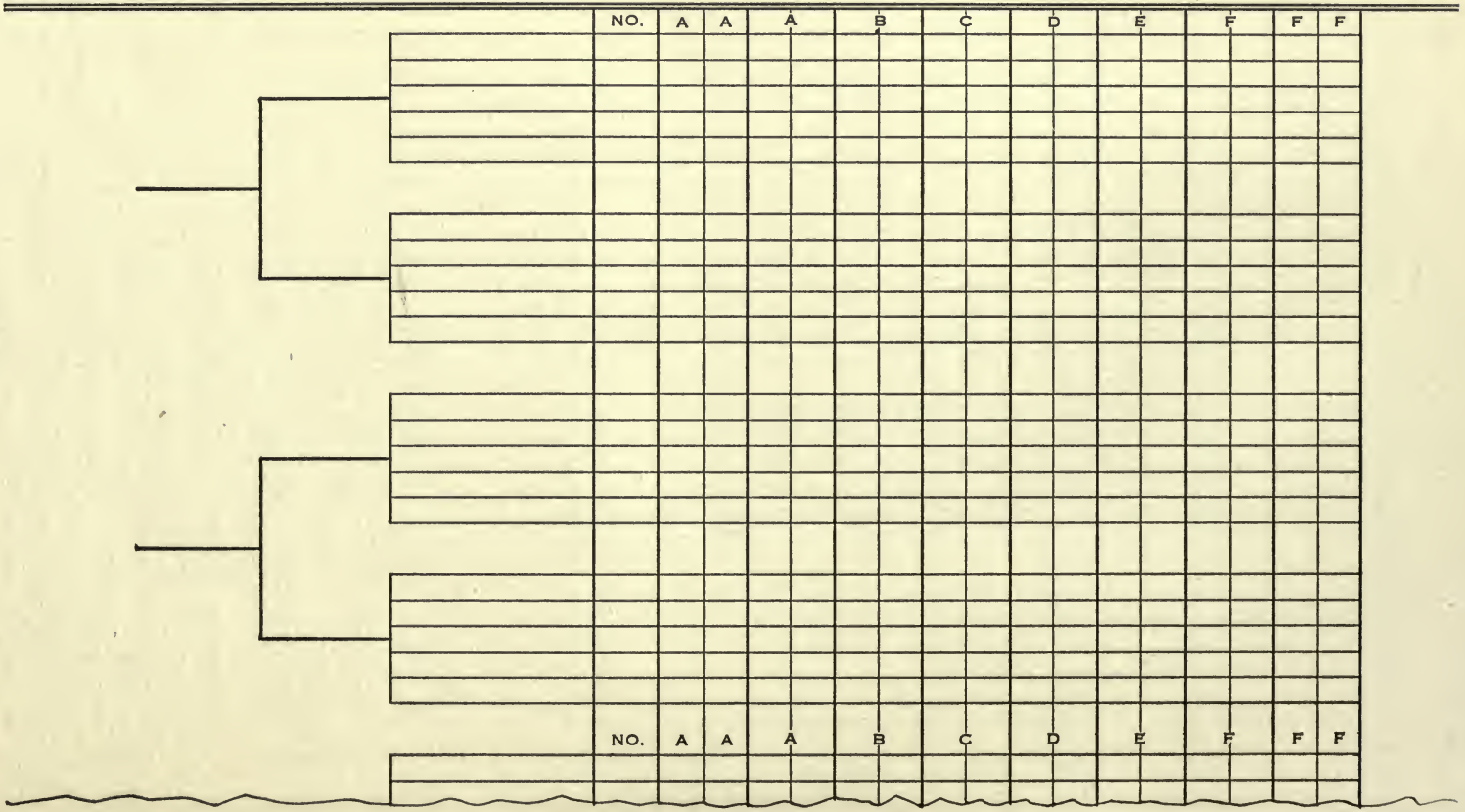
		TOTAL COST MATERIAL				
		TOTAL LBS. PIECE BUILT HEELS				
		PIECE LABOR PRICE				
TOTAL LBS. PIECE		TOTAL COST PIECE LABOR				
DAY BUILDERS		HOURS DAY LABOR				
		RATE PER HOUR				
		TOTAL COST DAY LABOR				
		TOTAL COST MATERIAL AND LABOR				
TOTAL LBS. DAY		PAIRS COMPLETE HEELS				
GRAND TOTAL LBS.		ESTIMATED VALUE PER PAIR				
ALLOWANCE FOR DAY LABOR		TOTAL VALUE				

DAY LABOR GAIN	DAY LABOR LOSS	GAIN			LOSS		

(Form 39A)

PATTERN CHART

Small, Nichols & Co., Inc., Boston.



(Form 39B)

PATTERN INVENTORY

Small, Nichols & Co., Inc., Boston.

PATTERN NO.	AA	A	B	C	D	E	F	FF	PART	PCS.	PRICE	AMOUNT	TOTAL	PATTERN NO.	AA	A	B	C	D	E	F	FF	PART	PCS.	PRICE	AMOUNT	TOTAL

Form 15, Last Order: This type of order is a time saver where lasts are ordered at frequent periods.

They can be made in duplicate or triplicate as desired. Some concerns also use a similar special form for ordering patterns. They save in time and errors.

Form 16, Financial Report: This form, which is generally made in duplicate or triplicate, may also have added to it the transactions in Notes Payable. These reports should be made daily, and are really more than the title indicates.

Through them an executive is holding a controlling account over the detail of most of his liquid assets and liabilities. They should conform to the ledger balances at all times.

Form 17, Order Register: This is a very useful record for the manufacturer who sells to the retail trade.

Duplicate sheets should be made, the copy to be sent to the salesman weekly. It saves writing letters and keeps him posted.

Salesmen's order books should be numbered with numbers of three or four digits, the first one or two at the left to indicate the salesmen. This system prevents the complete loss of an order, as sometimes happens where numbers are left to the salesmen, who frequently forget to fill them in.

Mail orders should be given the last consecutive number with a letter. To illustrate, an order bearing the number 5672 will indicate that the salesman is No. 5 and that the order is No. 672. The next mail order received should be numbered 5672A, this number to be continued with new letters until another order is received from the salesman.

Form 18, Shipment Register: This register corresponds to Form 17 and the same general rule applies to both. The two combined give the salesman all necessary information by which to keep his records.

Order Blanks and Factory Tags

While no forms will be shown here, the author wishes to state that many errors which are made in tag writing and shoemaking are directly traceable to poorly arranged order blanks and tags. Blanks and tags should always be arranged in similar order of printing, especially where all shoes are sold to be made special. The tag arrangement should follow the order, thus aiding the tag writer as much as possible.

The tag should be so arranged that workmen can readily see what they are to do.

Material to be used should never be mixed with the labor instructions, but each should be separate.

Form 19: It often happens that a customer's order is put into the works on several different dates. The shipper gets the first cases without knowledge of how many more are to come, or the sheets they will be on. When the shipping date arrives, he does not know where they are stored. This form conveys all this information to him very simply. The adoption of this system has saved the wages of several men in some instances.

Form 20, Sorting Report: In Chapter 7, Report No. 1, Upper Material shows a "Buying and Sorting Gain" of $1,274.34. This amount could have been taken from a recapitulation of records kept on similar forms.

Form 21, Sorting Slip: This is another style used for the same purpose as Form 20.

Form 22: On this form can be kept a history of an employee.

Forms 23 and 24, Inward and Outward Passes: These passes are quite necessary to control the going and coming of employees during work hours.

Form 25, Errors on Work Slips: This form is much used to notify employees of errors on their work slips which the checkers discover.

Form 26, Wages Voucher: The best results are obtained from these slips where they are filled out and distributed to the employees the day before pay day. If correct, the employees should sign and return the slips, exchanging on pay day for their envelopes.

Form 27, Delayed Production Report: Where the Production or Sheet System is really operated, no delay is allowed to occur unless a report is sent to the Production Manager.

Form 28, Damaged Tag: This damaged tag is made in duplicate and the instructions for the repairs to be made are designated by using a punch, the original and duplicate tag being punched at the same time. The original should remain attached to the shoe so that the inspection department will notice that it has been repaired and will give the shoe more careful inspection.

Form 29, Raw Stock: This form was designed to show a complete record where several shipments were received of the same lot of stock. Part was resold and part manufactured. The result was all on one record.

Form 30, A and B, Continuous Cutting: Some manufacturers like to use an envelope where several slips can be filed until a lot of leather is cut. The perforated margin is then removed, the envelope flattened out and the results of the lot entered thereon.

Form 31, Sole Leather Sorting Record: This simple and easily kept record was designed for a concern which buys only cut soles.

Form 33, Sole Leather Cutter's and Sorter's Slip: As indicated by the name, this form is arranged to give a com-

plete record of the cutting and sorting on one sheet. In Chapter 6 (Form 8) is shown a cutter's record by itself.

Form 34, A and B, Insole and Tap Cutting and Sorting: The manufacturer for whom this was designed wanted to know the exact cost of everything he cut. By the use of this form he was enabled to satisfy his desire in this particular.

Form 35, Top Cutting: The company who use this form do not deceive themselves about costs. They know what every part costs and why. They know that it is essential to have the cost of material and labor, but those two items are not enough if a comparison is to be made with the price at which an article can be purchased. There must be an expense burden added. It is a common practice among shoe manufacturers who cut their own soles, insoles, etc., to estimate the cost without adding any expense burden. Neither do they keep accounts to learn the costs of the department which produces these parts.

Forms 36, 37, 38: These are heel department forms used in a heel factory.

Form 39, A and B, Pattern Chart: This sheet was designed for use in factories where several sets of quarters or foxings are interchangeable with one or more sets of vamps.

These interchanges can all be illustrated on these charts so that it is possible at all times to see just what combinations can be worked. Much time and money can be saved in many shops by using something of the kind. Errors will be greatly reduced.

If a numbering plan is used, as suggested in Chapter 16, a pattern number will indicate the kind of pattern, and also the other patterns with which it forms combinations.

On the reverse side (Form 39 B) an inventory can be kept showing the number of pieces and their cost.

THIS BOOK IS DUE ON THE LAST DATE STAMPED BELOW

AN INITIAL FINE OF 25 CENTS WILL BE ASSESSED FOR FAILURE TO RETURN THIS BOOK ON THE DATE DUE. THE PENALTY WILL INCREASE TO 50 CENTS ON THE FOURTH DAY AND TO $1.00 ON THE SEVENTH DAY OVERDUE.

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